RAILROAD GAZETTE

FRIDAY. MARCH 22, 1895.

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Contributions.

Night Signals.

NEW YORK, March 18, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The continued interest shown by railroad men in the subject of a night position signal, the many kindly words in reference to the parabolic illuminated semaphore received in person, or found in the columns of the *Railroad Gazette*, the statement of one writer, Jan. 18, that "every practical signalman would like to see the Koyl semaphore made perfect and adopted," my natural desire not to leave unfinished an invention for whose usefulness I had fond expectations, perhaps, also, the editorial hope of Feb. 1, that we would "continue to invent and to advertise," cause me to send you a brief statement of the later development and present condition of the semaphore and of a difficulty still to be overcome. Perhaps some one more fertile in invention than I may profit thereby.

It is believed that the formulæ for the curvature of the blade and of the reflecting wave surface are correct and complete, since the appearance and illumination of the signal when new are always satisfactory, it being brilliant and effective, very distinctive and easily visible as a signal at a distance of more than a mile.

In its first construction the blade was of wood, for lightness combined with rigidity, and the reflecting surface of inset silvered glass for the sake of brilliancy. But the glass was brittle and rather heavy, and, with its exact curvature, accurate wave surface, careful silvering and tedious fitting was expensive; and I substituted an aluminum reflector which obviated most of the difficulties of the glass and was believed to be proof against the corrosive effects of moist air and locomotive gases. The belief, however, was delusive, whether from impurities in the metal or because aluminum is really more easily corrodible than is generally understood; and having since made various other tests I incline to the belief that, at present, time is wasted if spent in an endeavor to find a metal reflector capable of retaining sufficient brilliancy under the ordinary conditions of railroad signal service. Glass, however, takes and retains a very high polish, and I have steadily aimed to get it thin enough to be light, so secured as to be independent of its brittleness, and its manufacture so simple as to be comparatively inexpensive—all with such results as a later paragraph shows.

The wooden blade, the second objection, was of course a temporary device, and due to difficulty in designing one of metal which should be at the same time cheap, rigid and light—for the semaphore is not small, is suspended entirely from one end, and has to withstand considerable wind pressure and much banging. I now have a steel blade which is entirely satisfactory and weighs only seven pounds when ready for mounting in the standard semaphore castings in ordinary use.

A third objection was made to the parabolic semaphore as first constructed. It was said to be a better night than day signal, because in the daytime the strip of reflector, 4 in. wide along the center from end to end, detracted just so much from the expanse of brilliant vermilion, which gives to the ordinary semaphore its striking appearance against an ordinary background.

The endeavor to remedy these three defects, and to produce a semaphore as good as any other by day and better than any other by night, has resulted in a steel blade, whose reflecting surface is of glass, melted to the steel in a very thin layer, the weight of which is negligible, and *the color of which is the color of the blade.* If the blade is green the glass is green; if the blade is yellow the glass is yellow; if the blade is red the glass is red.

Nearly all the conditions necessary to a satisfactory signal are fairly well met, but the red glass is not vermilion red, and that is my difficulty. Many days and nights of study have failed to produce a glass which, under such circumstances, will in the daytime appear vermilion, and a handsome reward awaits the man who will show me how to make it. Yet, notwithstanding this delay, I am with Mr. Lattig when he says, Jan. 11, "The perfect night signal is coming."

C. HERSCHEL KOYL.

The Railroad Periodicals of the World.

Hopkins Railway Library,
STANFORD UNIVERSITY, Cal., Feb. 6, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I send below a list of the railroad periodicals of the world which is as complete as I am able to make it, but which, without doubt, is still incomplete, and which does not include periodicals no longer published. I shall be glad to get from any of your readers information concerning the titles to which a question mark is prefixed, and also information of periodicals, the names of which do not appear in this list.

FREDERICK J. TEGGART.

American Engineer and Railroad Journal, New York.
Archiv für Eisenbahnwesen, Berlin.
Avenir (L') des Chemins de fer, Paris.
Big Four Gazette, Cincinnati.
Bollettino dei Trasporti e dei viaggi in ferrovia, Milan.
Brotherhood of Locomotive Engineers Jou nal, Cleveland, O.
Bulletin annoté des chemins de fer en exploitation ou recueil periodique des lois, décrets, etc, Paris.
Bulletin de la commission internationale du Congrès des chemins de fer, Brussels.
Bulletin de la Ligue du commerce, de l'industrie et de l'agriculture pour l'amélioration des tarifs des chemins de fer, Paris.
Bulletin des transports internationale par chemins de fer, Berne.
Chemin de fer (Le), Paris,
Cook's Excursionist and Home and Foreign Tourist Adverliser, New York.
Deutsche Verkehrs-Blätter, und Allgemeine deutsche Eisen bahn-Zeitung, Leipzig.
Echo (L') des chemins de fer, Paris.
Eisenbahn (Die), Schweizerische Wochenschrift für die Interessen die Eisenbahnwesens, Zurich.
Eisenbahn-Fahrbeamte (Der), Berlin.
Eisenbahn-Jahrbuch der Oesterr.—Ungar. Monarchie, Vienna.
Eisenbahn Verordnungs-Blatt, Berlin.
Eisenbahnwesen (printed in Russian), St. Petersburg.
Engineering News and American Railway Journal, New York.
Gaceta (La.) de los ferrocarriles de Cuba, Havana.
(?) Gazeta dos Caminhos de Ferro, Lisbon.
Giornale dei lavori pubblici e delle strade ferrate, Rome.
Great Northern Bulletin, St. Paul, Minn.
Headlight (The), (Y.M. C. A.), Detroit, Mich.
Herepath's Railway and Commercial Journal, London.
Home Journal ("Home" for aged and disabled railroad employees), Chicago.
Industrie (L') Journal des chemins de fer, Paris.
(?) International Railroader (The).
(?) Italia ferroviana.
Journal des Chemins de Fer, des mines et des travaux publics, Paris.
Journal of Railroad Car Heating, New York.
Journal (American) of Railway Appliances, New York.
Journal des Transports, Paris.
Locomotive (La) bulletin officiel trimestriel de la chambre syndicale des employés de chemins de fer et des industries similaires, Paris.
Locomotive Engineering, New York.
Locomotive Firemen's Magazine, Terre Haute, Ind.
Magazine of Travel, New York.
Maine Central, Portland, Me.
Monitore delle strade ferrate e degli interessi materiali, Turin.
National Car and Locomotive Builder, New York.
New South Wales Railway Budget, Sydney.
New York Railroad Men, New York.
Official Railway Equipment Guide, New York.
Oesterreichische Eisenbahn-Zeitung, Vienna.
Organ f. d. Fortschritte d. Eisenbahnwesens in techn Beziehg, Wiesbaden,
Pennsylvania Railroad Men's News, Philadelphia.
Progrès des chemins de fer. Journal mensuel, Paris.
Railroad Car Journal, New York.
(?) Railroad Employee, New York.
Railroad Gazette, New York.
Railroad Telegrapher, Vinton, Ia.
Railroad Trainmen's Journal, Galesburg, Ill.
Railway Age and Northwestern Railroader, Chicago.
Railway Agent and Station Agent, Cleveland.
Railway and Shipping Contractor, London.
Railway and Tramway Review, Sydney, N. S. W.
(?) Railway Clerk, Cincinnati.
Railway Conductor, Cedar Rapids, Ia.
Railway Engineer, London.
Railway Engineering and Mechanics, Chicago.
(?) Railway Engineers' Journal, Chicago.
Railway Equipment Guide, New York.
Railway Herald, London.
Railway News, London.
Railway News-Reporter, Omaha, Neb.
Railway Official Gazette, London.
Railway Press, London.
Railway Record, London.
Railway Register, St. Louis.
(?) Railway Reporter, Pittsburg.
Railway Review, Chicago.
Railway Review, Christchurch, N. Z.
Railway Review, London.
Railway Service Gazette, Toledo, O.
Railway Signal, London.
Railway Supplies Journal, London.
Railway Surgeon, Chicago.
Railway Times, Brisbane, Queensland.
Railway Times, Ipswich, Queensland.
Railway Times, London.
Railway Times (Organ Am. Ry. Union), Terre Haute, Ind.
Railway World, London.
Railway World, Philadelphia.
Recueil général des tarifs de chemins de fer pour les transports à grande et à petite vitesse, Paris.
Revue des chemins de fer, Journal financier, Paris.
Revue générale des chemins de fer, Paris.
Revue pratique des chemins de fer, Paris.
Revue universelle des chemins de fer, Paris.
Rivista generale delle ferrovie e dei lavori pubblici Firenze.
Roadmaster and Foreman, Chicago.
Saturday Morning Railroader, Hornellsville, N. Y.
Street Railway Gazette, Chicago.
Street Railway Journal, New York.
Street Railway Review, Chicago.
Switchman's Journal (dead?), Chicago.
Trackmen's Journal, Battle Creek, Mich.
Transport, London.
Transportation, New York.
Tribune des chemins de fer, Journal des intérêt des employés de chemin de fer, Paris.
Verordnungsblatt des K. K. Handelsministeriums für Eisenbahnen und Schiffahrt, Vienna.
Victorian Railway Gazette, Melbourne, Victoria.
Victorian Railway News, Melbourne, Victoria.
Voie étroite (La), Paris.
Voie ferré (La), Moniteur des chemins de fer, Paris.
Wochenschrift f. deutsche Bahnmeister, Berlin.
Wochenschrift f. Eisenbahnbetriebs u. Verkehrsbeamte, Berlin.
Wochenschrift f. Eisenbahnstations u. Expeditionsbeamte, Berlin
Wochenschrift f. Eisenbahn-Telegraphen-Beamte, Berlin.
Zeitschrift des Ministeriums der Verkehrsanstalten (printed in Russian), St. Petersburg.
Zeitschrift f. d. ges. Local, u. Strassenbahnwesen, Vienna.
Zeitschrift f. d. internationalen Eisenbahntransport, Berne.
Zeitschrift f. Eisenbahnen u. Dampfschiffahrt der Oesterreichisch-Ungarischen Monarchie, Vienna.
Zeitschrift f. Kleinbahnen, Berlin.
Zeitschrift f. Lokomotivführer, Hanover.
Zeitschrift f. Transportwesen u. Strassenbahn, Berlin.
Zeitung des Vereins Deutscher Eisenbahn-Verwaltungen, Berlin.

To these 114 titles might be added the names of many other periodicals which are authoritative in railroad circles, although not exclusively devoted to railroad interests.

Bradstreet's New York.
Commercial and Financial Chronicle, New York.
Engineer (The), London.
Engineering, London.
Engineering, Review, London.
Annales des ponts et chaussées, Paris.
Centralblatt der Bauverwaltung, Berlin.
Zeitschrift f. Bauwesen, Berlin.
Indian Engineer (The), Calcutta.
Indian Engineering, London.

Grand Trunk Insurance and Provident Society.

The tenth annual statement of the Insurance and Provident Society of the employees of the Grand Trunk Railway of Canada has just been issued. It is for the year ending Dec. 31, 1894. Numerous items in the report are of interest as showing features in the general plan and management which are different from those of the similar organizations on the Pennsylvania and other railroads in the United States.

The sick benefit fund and the insurance fund are kept separate, and each one deals with cases caused by accident on the same basis as with those caused by ordinary sickness, the rates of premium and the amounts paid evidently being uniform without regard to the cause of the sickness or death. From the sick benefit fund $6,000 was paid out in 1894 to "incurable members," evidently final payments; and the payments from the insurance fund include sums paid to employees who leave the service of the road for the reason that they are unfit for further work of any kind. This is called commuted insurance.

The total number of members is 12,629, divided into six classes, according to the amount of insurance taken. Nearly 8,000 are in class F, in which the insurance is $250 and the assessment (in 1894), $2.85 per member. The highest insurance is $2,000, on which the assessment was $16. The total amount of insurance outstanding is $37,163,50. Besides the regular business, as stated, 2,128 temporary employees were insured against accident only.

The financial statement of the sick benefit fund shows payments to members in 1894 amounting to $52,356, including the $6,000 to incurable members. For medical attendance, $22,033 was paid. The contribution by the railroad company for the year was $12,500, which is about one-fifth as large as the sum paid in by members and more than twice the sum reported as paid out by the society for salaries, printing, and other expenses. Of the 12,629 members 461 are "retired members" who, it seems, participate in the insurance fund, but not in the sick bene fit fund. The death claims paid in 1894 amount to $67,630 The total of death claims paid in ten years has been $646,854 and of sick benefits $437,036. The total number of insurance claims paid in 1894 was 162; these were divided as follows: Commuted insurance, 36; deaths from accident, 30; deaths from other causes, 96. The total number of sick benefits paid was 5,681 (averaging $9.22 each), of which 1,023 were the result of accidents. One hundred and two members of the society are in the general offices, 2,361 in the engineer's department, 5,412 in the mechanical department, including enginemen and firemen, and 4,293 in the train and station service. The Secretary of the Society is Mr. H. B. Moore, of Montreal.

Bridges for the Chicago Track Elevation.

The general style and the details of the floor construction of the bridges for the Chicago track elevation are shown in the engravings which we present this week. They apply to the bridges spanning 60-ft. streets without intermediate columns, and comprise an end view and cross section, a longitudinal section and floor plan, and details of the floor-beams, hanger plates, rails, rail bolts, etc.

The five trusses making up a four-track bridge are alike in sectional area and details, so that additional tracks can be provided without reinforcement or change. They rest at each end on a wall plate one inch thick, and securely anchored to the masonry. The webs of the girders are ½ in. thick, reinforced at the top and bottom chords to 1¼ in. The top chord is made up of 6 in. angles, ⅝ in. thick, and cover-plates, 16 in. × ⅝ in. The bottom chord is similar to the top chord, except the first lower cover-plate, which is 21 in. wide, so that a riveted connection can be obtained with the lower flanges of the floor-beam hanger plates for the purpose of obtaining side stiffness. The upper corners of the girder are rounded, and the top chord angles are spliced at the tangent points. The first top cover-plate is spliced at each end by the second, but all other chord members, and the entire lower chord, is made without splice. The girders, when erected, will have a $\frac{5}{16}$ in. camber in the floor for the purpose of drainage.

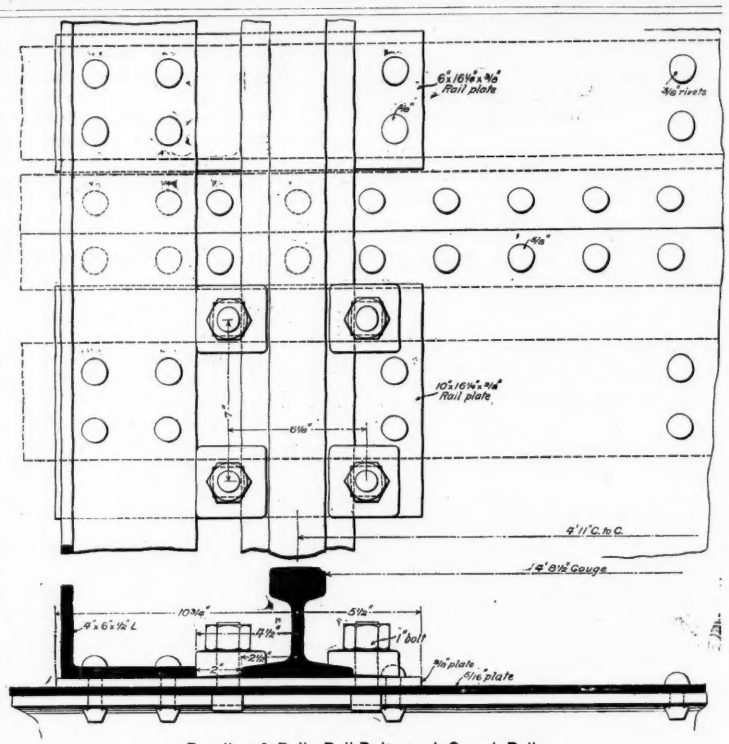
The floor is made up of 56 10-in. by 36-lb. I-beams for each track. These beams are cut at each end to an angle of about 60 deg., as is shown in the detail plan of the floor beam and connections. The hanger plates are 9½ in. by $\frac{7}{16}$ in., riveted in the shop to each end of the floor beams by means of angle lugs riveted to the webs. These floor beams are riveted to the girders in the field, with five rivets connecting each hanger to the web, and with two rivets to the 21-in. lower chord cover-plate for side stiffness. A continuous sheet of $\frac{5}{16}$ in. steel plates is placed on the floor beams, and riveted to them as shown. It is riveted to the webs of the girders by means of an angle iron, and is spliced at the joints with 5 in. by ⅜ in. lap-plates, placed below the surface, as shown in the engravings. This form of floor is strong and durable, and, at the same time, light and simple in construction. The beams, by deflecting, will form an elastic and easy roadbed.

Drainage is provided for by the camber of the floor, and at each end by a ⅛-in. sheet steel gutter, fastened to the floor plates by a 3-in. × 2½-in., × $\frac{5}{16}$-in. angle. From this gutter the water drains into a groove cut into the coping of the masonry, as shown in the engraving, and from here into the street.

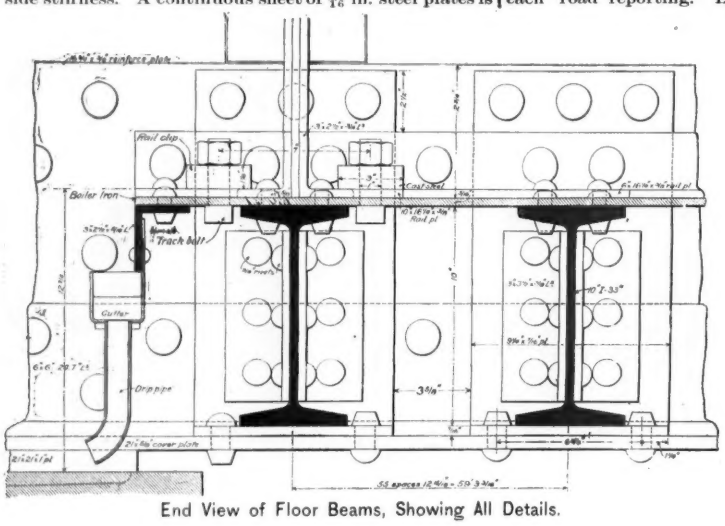
Upon the plate-covering of the floor, and riveted to it and to the floor-beams, as shown, are laid the rail plates and the guard rail. The rail plates are alternately arranged for rail fastenings, and for rail bearings only.

The material throughout will be soft steel, except the clip washers, which are of annealed cast steel.

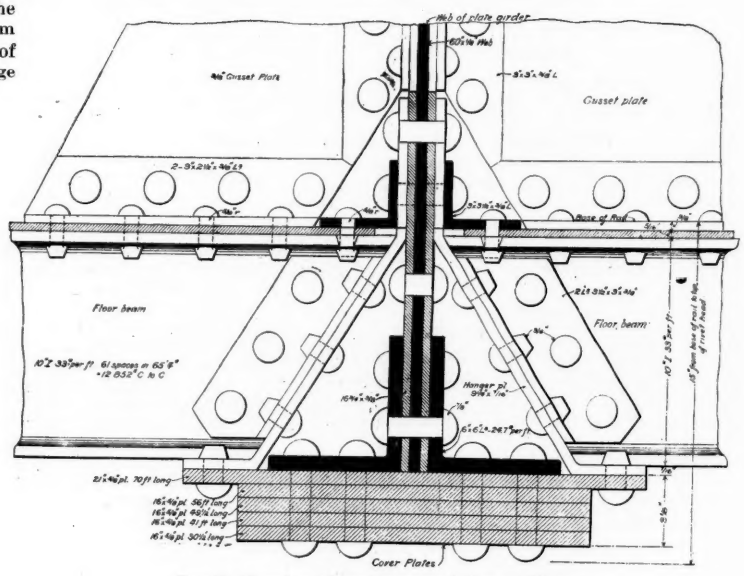
This form of floor has some advantages over other floors heretofore used. Its lightness, combined with great strength, and the absence of pull upon any rivets rendering the construction particularly stiff and durable, are both particularly desirable features. It might appear from the details of floor-beam connection that the floor-beams rested upon the extension of the first, lower chord, cover-plate, but this is not so, as the entire weight is taken up by the rivets in the hanger plates.



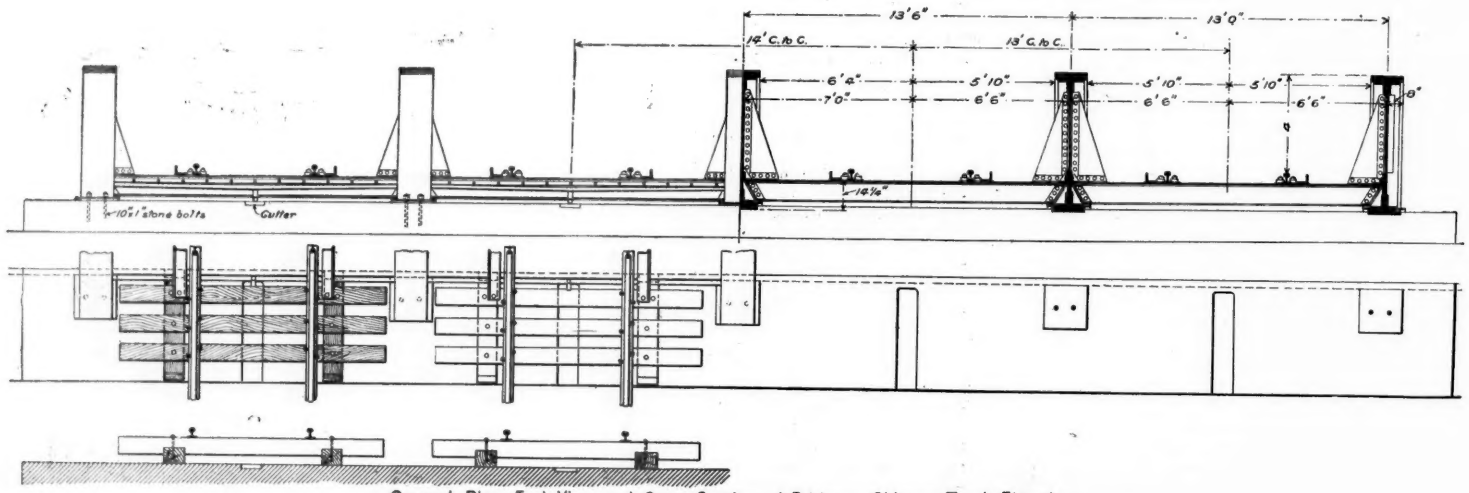
Details of Rail, Rail-Bolts and Guard Rail.



End View of Floor Beams, Showing All Details.



Details Showing Floor Beam and Gusset Plate.



General Plan, End View and Cross Section of Bridges—Chicago Track Elevation.

Minnesota Railroad Commissioners' Report.

The Railroad and Warehouse Commissioners of Minnesota, W. M. Liggett, George L. Becker and Ira B. Mills, have issued their report for the year ending Nov. 30, 1894. The length of railroad in the state is 5,912 miles, an increase during the year of 49 miles. The statistics, which are for the year ending June 30, purport to be for the State of Minnesota, though it was not stated on what basis the amounts are separated from the totals for the whole of each road reporting. Large decreases are shown, as in nearly every other state. The percentage of operating expenses to gross earnings was, however, a trifle less than for 1893, the figures for 1893 being 59.50, and for last year 59.04. The number of employees in Minnesota in 1894 was 18,550, a decrease from the previous year of 6,618.

The number of complaints made to the Commission has been less than in any other year since its organization. The relations between the public and the railroads are more harmonious than in former years, and in the matter of furnishing cars equitably to farmers for sending grain direct to large markets without the intervention of third parties, the railroads have evinced a commendable readiness to comply with the state law.

Where railroads have discharged station agents at small places on account of the falling off in business, the Commission has required compliance with the law to keep waiting-rooms open, warmed and lighted, for half an hour before and after each passenger train. The laws concerning the construction of private sidings to elevators and the erection of grain warehouses on railroad land at small stations are still in a state of uncertainty, though no great trouble has been experienced during the past year. One case under these laws is still pending before the state courts.

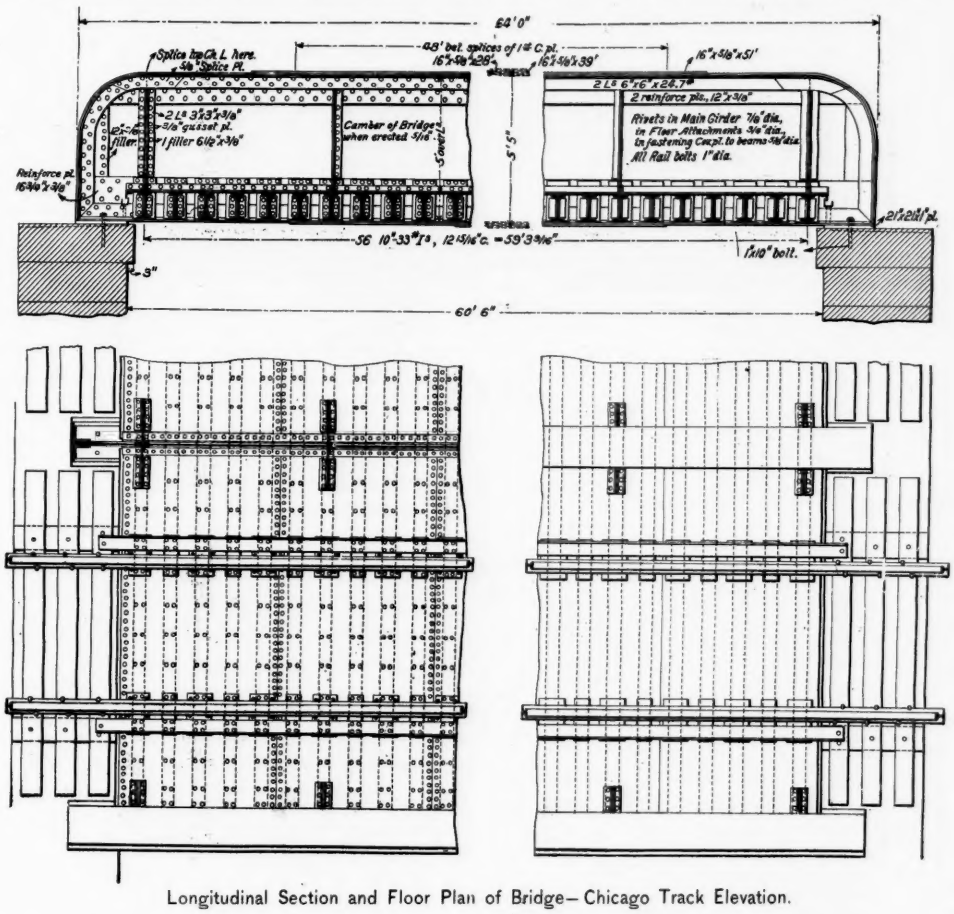
On Sept. 8 the Commissioners ordered a reduction in the rates on grain over the Great Northern on the complaint of Elias Steenerson, but the railroad appealed to the District Court, and the case is still pending.

One passenger, 39 employees and 52 other persons were killed during the year, and 43 passengers, 366 employees and 64 other persons were injured.

North Dakota Railroad Commissioners' Report.

The Railroad Commissioners of North Dakota, Peter Cameron, N. P. Rasmussen and B. B. Stevens, have issued the fifth annual report of that office. The fiscal years have lately been changed, and this report therefore covers an odd term. Like some other similar reports,

recently received, this one contains tabular matter sent in by the railroads in much unnecessary detail; and the summaries are in a form quite different from that found in any other report that we have seen. About 90 per cent. of the business done by the railroads running through North Dakota is interstate, which makes the statistics of but indifferent value. The length of railroad in the state is 3,567 miles. The number of persons killed during the year ending June 30, 1894, was 20, and of injured 112. The report proper comes *after* the statistics. The Commissioners say that their usefulness has been greatly impaired by attempts to legislate them out of office, and by the weakness of the laws under which they act. "Nothing can be so useless as a discredited office, and such this office has become." But they say that every law passed to weaken their power has proved abortive, and they remind the people of the state that an intelligent board of railroad commissioners is a necessity. The enforcement of railroad laws cannot be entrusted to county commissioners, sheriffs and state's attorneys. Only experts can deal with railroad



Longitudinal Section and Floor Plan of Bridge—Chicago Track Elevation.

cannot have a timetable for these trains instead of compelling passengers to wait several hours in suspense where there is no station building or other shelter.

Texas Railroad Commissioners' Report.

The Railroad Commissioners of Texas, John H. Reagan, L. L. Foster and L. J. Storey, have issued their annual report for the year 1894.* It opens with a discussion of the science of rate-making, which the reader is reminded is not an exact science. The Commissioners have found their time entirely taken up with fixing freight rates, but intend to give attention to the matter of express charges as soon as they can. Under the subject of rate-cutting and discriminations, they say that when the Commission was established and began supervision of rates, tariffs were stable; when the power of the Commission was suspended by injunction of the Federal Court, there was no stability, and complaints were frequent; and since the Commission resumed control of rates there has been greater stability, and there is little complaint of irregularity. "Thus the fixing of rates by an independent authority gives stability, without reference to whether the rates so fixed are high or low." The Commission tries faithfully to preserve an equitable and just relation between state and interstate rates and to preserve to the people of Texas the advantages of their location.

The law of 1893, requiring the Commissioners to regulate the issuance of railroad stocks and bonds, is believed to be important and beneficent. Under this law the Commissioners have proceeded to value the property of the railroads of the State and their experts have completed this work on 5,889 miles. The basis of valuation has been the present cost of reproducing the physical properties, and the average thus far is $15,926 a mile. The correctness of this estimate is believed to be corroborated by the figures of the Interstate Commerce Commission for 1891; which show, for group IX, $14,089 a mile. This is based on the capitalization of the net earnings of the roads at 5 per cent. The net earnings of the railroads of Texas for 1894 were equal to 5.47 per cent. of their value at the average rate ascertained by the Commissioners as above noted. This is believed to show that the railroads thus far built in Texas were necessary.

In making inspection of the roads the Commissioners have been impressed by the fact that the cost of operating many roads is made unduly large by the intrusion of 1¼ per cent. grades on divisions over which much longer trains might be hauled except for these obstacles.

The Commissioners recommend that express companies and construction companies be required by law to maintain general offices in the State.

The usual reports and statistics are given. The length of railroad in Texas is 9,154 miles. Six passengers, 73 employees and 99 other persons were killed during the year, and 135 passengers, 1,155 employees and 185 other persons were injured.

*A brief special report has just been made to the Governor, which is noted in another column.

Recent Sections for Street Railroad Rails.

We show herewith engravings of some of the latest sections for street railroad rails, which are being rolled to meet the demand for rails of the new deep pattern This type of rail has been the result of the necessity, in street railroad practice, of so laying rails that they will not interfere with the other street traffic, as well as to meet the demands of good city paving. To allow two inches of gravel between the top of the tie and the bottom of the paving stone, a rail must have a very deep web. At first the plan of raising rails of small depth upon blocks, chairs, longitudinal girders, etc., was tried and was not entirely satisfactory, and while the use of the deep rail was at first looked upon as a necessary evil, entailed by the depth of paving blocks, the advantages which have followed from their use are so great that they would be laid even though paving requirements did not demand it.

The splice-plate shown in Fig. 1 is a new and special

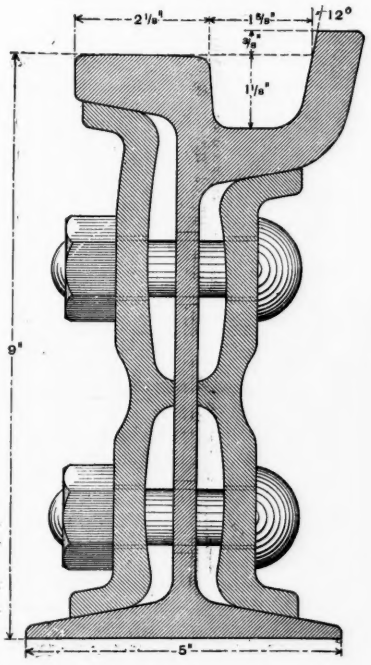


Fig. 1.—100-lb. Guard Rail for Curves.

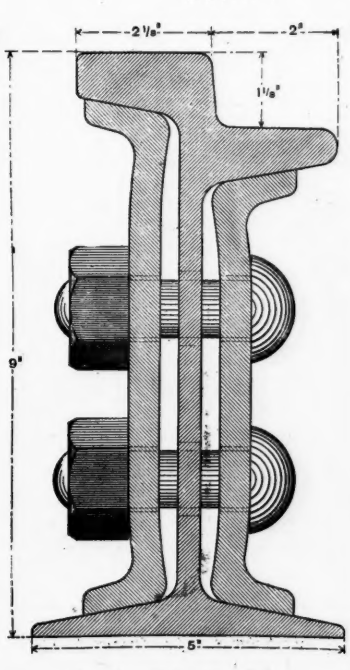


Fig. 2.—85-lb. Step Rail.

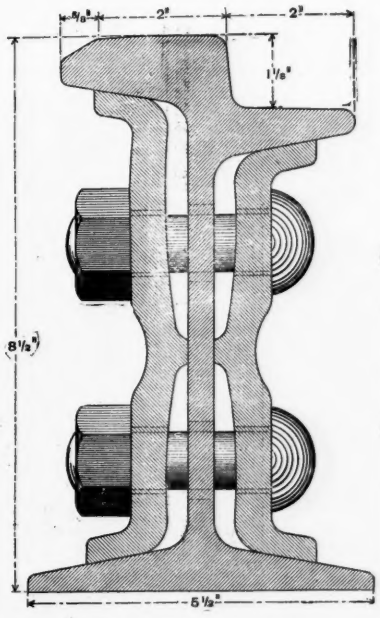


Fig. 3.—93-lb. Step Rail.

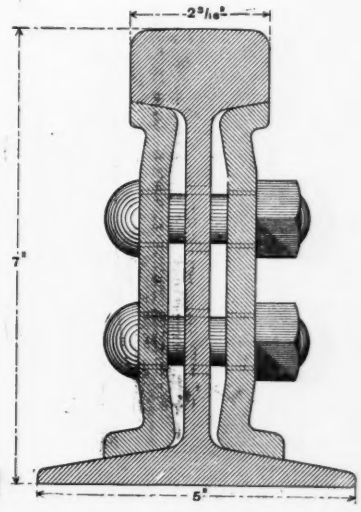


Fig. 4.—70-lb. T Rail.

Recent Sections for Street Railroad Rails.

experts. To this end the Commissioners ought to have long terms, and the law should arrange the elections in such a way that there would always be at least one experienced Commissioner.

A large part of the report is devoted to the grain traffic, demands of shippers for additional loading stations, etc. In making inspections of the various roads the Commis-

form, designed to prevent the springing out of the top and bottom of the plate when drawn in at the center. This form of splice-plate makes so tight a joint, and the friction at the bearings on the flange and head is so great, that a ¼-in. section, sawed from the end of a rail joint, has retained its ¼-in. sections of splice-plate until they were knocked off with a hammer. The center bear-

ing does not strike the web until the plate is sprung in by the tightening of the bolts.

The attempts that have recently been made to determine the proper shape of the guard rail on curves are interesting, but hardly valuable. Supposing it were desirable, even after determining such curve, to use it, its form, depending as it does upon the radius, ranging from 30 to 300 ft., and changing, in transition curves, at every point, upon the 30 or 40 different forms of wheel flanges in use, and upon the wheel base, could not possibly be determined except for each of an enormous number of individual cases, and in transition curves, for every point in the curve.

The deepest section which has so far been rolled is the 9-in. rail, shown in two forms in Figs. 1 and 2. The former is a guard rail for use on curves. It weighs 100 lbs. per yard, which is about 157 gross tons to the mile. A ton of these rails will lay 33.6 ft. of track. The second form, shown in Fig. 2, is a step rail, for straight work,

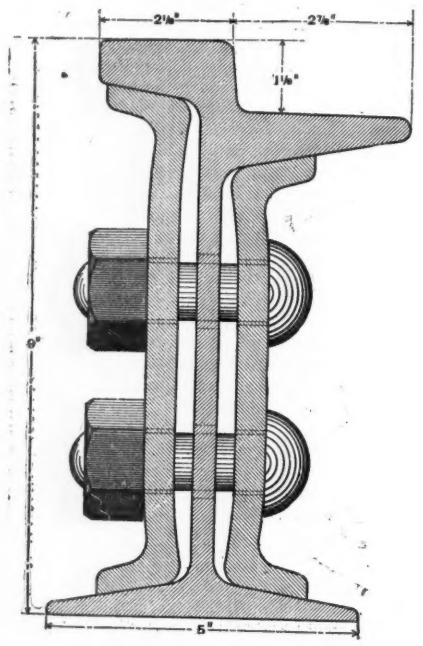


Fig. 5.—90-lb. Step Rail.

weighing 85 lbs. per yard, with the same height, 9 in. It has been much used, notably upon the Worcester Consolidated, the Lynn & Boston and the Consolidated Traction Company, of Jersey City.

Fig. 5 is the well known "Philadelphia section," a remarkable form of rail, which has been more used in the East than any other section. As will be seen, it weighs only 90 lbs. to the yard, and has a tread of 2⅜ in., which is ⅜ in. wider than that of the rail shown in Fig. 2. This rail has been used in Baltimore, Brooklyn, Philadelphia, Boston, New York, Cleveland, Chicago and many other cities. The Johnson company makes a similar rail, ¾ in. lower.

Fig. 3 shows an 8½ in. step rail, weighing 93 lbs. per yard. It has more weight in the flange and web than that shown in Fig. 2, and was an attempt to make a rail having all the advantages of a square-headed

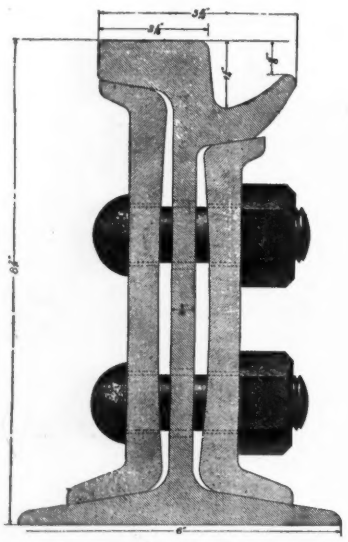


Fig. 6.—94-lb. Half-Groove Rail.

rail which would not obstruct street traffic. As will be seen, the corner of the head is cut away on one side, which allows vehicles to cross it easily. There are 55 miles of this rail in New Orleans, and it has replaced the ordinary form of step rail to a certain extent, in Louisville, Ky.

A rail similar to these, but having a half groove, is shown in Fig. 6. It has been adopted as a standard rail for city work by the Binghamton Railroad Company, and is illustrated in the February number of the *Street Railway Journal*. This rail, it is claimed, has given great satisfaction. A feature of its use is that trucks and other vehicles do not use the tracks for driving upon. It is also claimed that it requires no more power to operate over than the ordinary T rail. A somewhat similar rail, but with a full groove, has been used in Washington, but has given trouble during cold weather, because of the tendency of ice to form in, and clog up, the groove. This would appear to be equally true of the half-groove rail, Fig. 6, but, as will be observed, the groove is shallow and its angle is such that the flange of the wheel can crowd out any ice or snow which may be present.

The American Street Railway Association suggested in its report the use of the T rail. Its use has become much more general, of late especially in the West. One great difficulty is to so pave up to it that no obstruction to other street traffic is presented. This has been successfully accomplished in several instances, notably at San Francisco, and at Des Moines, Iowa. We show in Fig. 4 a form of T rail 7 in. deep and weighing only 70 lbs. to the yard. This is a remarkably light but stiff section. A ton of these rails will lay 48 ft. of track, which is equal to 110 gross tons to the mile. Were it not for the city laws, which in most cases forbid the use of the T rail, there is no doubt that it would in a short time be much more generally used.

In the West, both side-bearing and Trails are, as a rule, lower than those used in the East, a result of the fact that the paving blocks used in the majority of western cities are not so deep as those used in the East.

All these rails are being rolled this year by the Pennsylvania Steel Company, except that shown in Fig. 6, which is made by the Johnson Company, of Johnstown, Pa. The former company has so far this year made contracts for about 40,000 tons of street railroad rails, for delivery in 1895. The average price is about $24, a figure which seems very low, when we remember that the price less than three years ago was over $40 a ton.

Memorandum for Comparison of Methods in Motive Power Department.*

Are the standards laid down by the management being followed?

Have they been found faulty in any respect? In both engines and cars can any further advance be made toward simplicity of construction and a reduction of the number of parts, or can additional working parts of the various standards of locomotives and cars be made interchangeable.

Are the steam producing and heating plants in the various shops doing good work, as far as arrangement of details and care in use are concerned?

Can they be improved readily without going to any material expense?

Are the methods of shop and office heating the cheapest and most efficient that can be used without material overhauling of the same? Can the use of exhaust steam be extended?

Can any improvement be made in economy of shop or yard lighting?

Are the various steam engines and other steam-using apparatus doing economical and efficient work?

As far as possible it would be well to examine water station engine plants.

Is the shafting in good shape, and do the tools seem properly speeded?

Are the tools arranged, both as to grouping and also the individual handling of each tool, to do the best work? and the use of oil, both on shafting and tools, well looked after?

Does the shop supervision and discipline seem good?

Is the making and repairing of small tools and other shop appliances properly checked, so that foremen will not spend too much money in this direction.

Are the proper means used without much expense for taking advantage of the various methods of saving time in force at some places by means of compressed air, or other special tools?

Is anything being made at the shops that could be bought more cheaply, or vice versa. Prices are changing more or less just now.

When engines or cars are in the shops for special repairs, is work done on other parts which need not have been done until there was need of general overhauling?

Is higher mechanical finish put on any of the work than efficiency and economy demands, or is too high priced material used for any purpose? This applies also to painting engines and cars and to woodwork on same.

Is all material, either new or old, around the shops proper, properly cared for, or disposed of, and are the yards, floors and tools neatly kept, and are all small tools well cared for.

Are all orders affecting the working of the various branches of the Mechanical Department so transmitted down the official line that each subordinate foreman appreciates how they affect his work?

Is there any direction in which too much time or material seems expended in shop practice, especially as regards common labor, or damage to material in working?

Is scrap material used, as far as can be economically done, before calling for new? This applies to metals and lumber to be worked up, and old wood, shavings, etc., to be used as fuel.

Do the forms of shop requisitions, orders, time books, etc., used seem a complete check upon expenditures?

Is there a good system of handling material, and the transmission of orders and messages from shop to shop so as to save the time of men in going from place to place or in the extra handling of material?

Is any locomotive or car material carried at the store houses that the mechanical department does not need, or is there any accumulation of supplies or unstandard material?

Is all second-hand material that can be used elswhere reported on the surplus list?

Are the shop yards so policed that every foot is under the charge of some one official, and any material not belonging to the department in charge of the yard, reported to the proper parties, or otherwise disposed of?

Can shop office methods be improved upon to keep all necessary records at less cost?

Is the condition of engines kept up as regards freedom from throwing fire?

Are the methods of clinkering, coaling and sanding engines efficient and economical?

Is the engine coal supply so arranged that a uniform quality is furnished at the shop in question?

Are any more engines kept in service than the traffic seems to demand?

Do the trains seem properly loaded from the motive power standpoint, so as to get the best work out of engines?

Is there any unnecessary movement of light engines?

Are the road foremen keeping a constant watch of the working of the different men and engines, as regards proper handling of engines, and the use of fuel and supplies?

* A circular recently sent by the general manager of a large western road to all master-mechanics, shop-foremen and gang bosses. Similar circulars had been sent before, and as a consequence the inspection visits of general officers produced much more satisfactory results than had been the case previously.

A New Signal Manipulator.

The engravings printed herewith show the appearance of an apparatus made by the Automatic Railway Signal Co., of 120 Broadway, New York City, and recently patented, for actuating semaphore signals at points distant from the tower, where the expansion or contraction of the wires, in consequence of changes in the temperature of the atmosphere, is likely to impair the efficiency of the signal.

The main part of the machine is contained in an iron box which is fixed to the signal post about 4 ft. from the ground, as shown in Fig. 1. The essential feature of the device is a motion plate, combined with locking levers so arranged, in connection with the main signal wire, as to enable the operator to effect a short move-

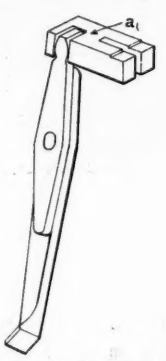


Fig. 4.—Lock Bar for Signal Manipulator.

Fig. 1.—Signal Manipulator.

ment, of fixed length, of the rod attached to the semaphore, by making a long movement, which may be of variable length, of the signal wire.

Referring to Fig. 1, the ordinary balance lever and counterweight of the semaphore have been removed. A pulley is fixed near the top of the post, just below the main bearing of the semaphore arm, and the operating wire, passing upward through the "manipulator," runs over this pulley, down to the pulley at the bottom of the post, and back to the tower in the usual manner. This wire is indicated by the figures, 6, 5, 1, 2, 3 and 4. It is partly hidden behind the rod attached to the semaphore.

The semaphore blade is weighted so as to be almost perfectly balanced in any position.

The signal wire actuates the semaphore by means of rod a, a^1, Fig. 2, as is clearly seen in Fig. 1.

Referring now to Fig. 2, which shows the manipulator with the front cover removed, a is a sliding bar, with a notch a^3 midway between its two ends. The signal rod

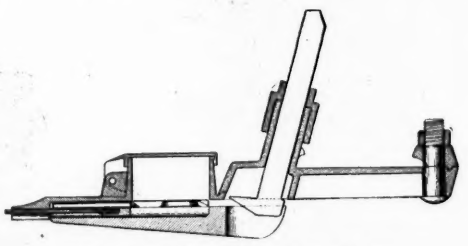


Fig. 5.—Torpedo Placer—Sectional View.

is connected to this bar by means of a crank, attached above a^1. To the lower end of a is connected a round rod a^2, upon which is fixed a collar c. A carrier and grip b is fastened to the operating wire, which wire, 15, 16 (6, 5, 1, 2 in Fig. 1), runs through the box. This carrier is so shaped that a sliding bolt working freely in it through a horizontal mortise follows grooves in the front and back covers of the box, which grooves are so shaped that the carrier in its up-and-down motion engages the bevelled notch a^3 in the sliding bar when it reaches the right point in its stroke and moves the bar precisely the distance necessary to change the signal arm from th danger to the safety position, or vice versa.

The compound levers m, n and o, p actuate locking bars g g at either extremity of the box, which, moving horizontally, lock the signal in position after the bar a has completed its stroke. These levers are moved by th carrier b. The locking bar is shown on a larger scale in Fig. 4. After the lock lever has moved,

fastening the signal, the wire, with its carrier, *b*, still has several inches of free movement, to allow for irregularity. Expansion and contraction is ignored and the wires can be left practically slack, so that there is no strain on the connections, and very little wear.

The safety weight on this signal is so arranged that it remains stationary, except in case of breakage of wire, so that it never has to be moved by the signalman. The weight is suspended by a piece of band iron, *j*, which has a hole in its upper end, engaging with a pin at the top of the box, as shown in Fig. 2. The weight appears at *G G*, at the bottom of the machine. The carrier *b* has upon its under side four lugs by which it is compelled to slide up and down in line with the band *j*. This band is bent near its upper end, so that the lugs on the carrier, if it should approach the upper end, as it would (being pulled by wire 1, 2, 3, 4), if the wire should break below the carrier, would force the band off the pin upon which it hangs, allowing the weight to drop. As the weight drops it strikes the collar, *c*, fixed to the rod, *a*, pulling the signal to the danger position. If the wire should break above the carrier (at 1, 2, 3, 4, Fig. 1, or anywhere beyond), the weight of the apparatus would carry the signal to danger. The upward movement of the carrier *b*, when the wire breaks below it, releases the locking bar *g* at the top of the box by striking the cam-like projection on the under side of the locking bar and similar action would take place at the bottom if the failure were on the other side. Upon repairing the broken wire the weight is again hung upon the pin and the apparatus is again in working order.

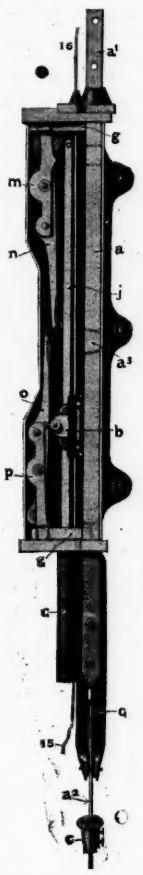


Fig. 2.—Signal Manipulator, with cover off.

This apparatus has been in operation several months on the New York Central & Hudson River road at Croton Landing, N. Y. The makers are so confident of its merits that they are ready to use it for operating switches, with pipe connections.

Figs. 3 and 5 show a simple torpedo placing machine made by the Automatic Railway Signal Co. The plunger, shown in position at the side of the rail head, has at its lower end a wedge-shaped head under which the torpedo passes, raising the plunger above the level of the rail, where it is in position to be depressed by the first wheel that passes over the track, crushing the torpedo. The

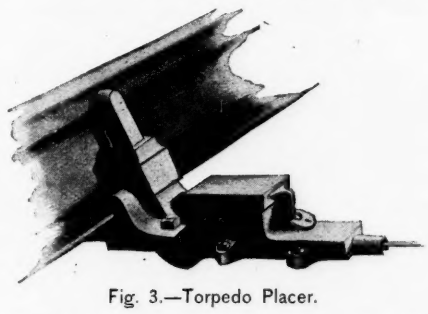


Fig. 3.—Torpedo Placer.

withdrawal of the torpedo by the connecting rod allows the plunger to fall by gravity to the position shown in the cut. The magazine, shown locked with a padlock, contains six torpedoes, which fall by gravity upon the carrier attached to the connecting rod. This machine actuated as shown in Fig. 1 in connection with the semaphore forms a simple combination of the audible and visual signal.

Some New Baker Heating Devices.

Mr. Wm. C. Baker, manufacturer of car heaters, has erected on the roof of one of his buildings, three stories from the ground, a 70-ft. passenger car, fitted with steam heating pipes in several different styles for experimental purposes, in which position the car is under conditions very similar to those found in actual practice. One is a heat storage system, consisting of a 4-in. pipe running along each side of the car inside a long wooden box. These pipes within the car, are filled with gravel. A perforated copper plate, running horizontally the length of the pipes, cuts off a small segment at the bottom of them, in which the steam circulates. They are to be charged with steam at high pressure. This steam heats the gravel, and the heat in the pipes is constantly restored by steam rising through the perforations in the copper plate, into the gravel spaces of the pipes. Another novelty consists in a heat storage cylinder resembling, and suspended similarly to, a Pintsch gas tank. This cylinder is filled with pebbles, among which circulates a coil of pipe containing water, and leading to the piping system in the car. The cylinder is charged with steam at high pressure from a stationary boiler. Mr. Baker claims that such a charge will easily heat the car for 30 hours. The admission of steam to the pipes in the cars, from the coil in the storage cylinder, in which it is generated, is automatically regulated by a brass expansion valve.

Besides this system, and a standard system of piping for passenger cars, also on exhibition in this car, there is shown the piping system for the new Pullman compartment cars.

The exhibition car at the Baker works at 127-129 Grand street, Hoboken, is open for inspection to railroad men. It will be used during the spring for the purpose of making comparative tests of the different systems of car heating which we have described.

The Timms Continuous Draft Rigging.

A patent has been granted to Mr. James Timms for the continuous draft rigging shown by the accompanying illustration. This rigging will be introduced by the Buckeye Malleable Iron & Coupler Company of Columbus, O. It consists of cheek plates placed as shown on each inner face of the centre sills. These plates are rabbitted into the sills and serve as guides for the cross bars to which the continuous eye bars are connected as shown. There are the usual draft springs and followers, but these followers have a projection, and a recess on the back end to receive the cross bars, as shown in Fig. 3. Fig. 1 shows the eye-bars and Fig. 2 the construction in detail. The operation is as follows: The draw bar pulls on the first cross bar and then, by means of the short links, pulls on the back follower of the nearest draft spring and, through the long eye bars and the short ones on the opposite end of the car, the pull is transmitted to the draft spring on the other end of the car. This connection is

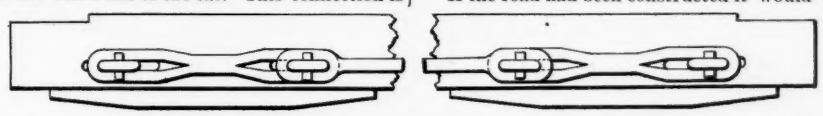


Fig. 1.

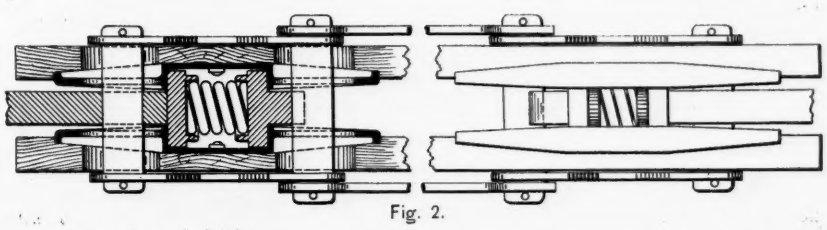


Fig. 2.

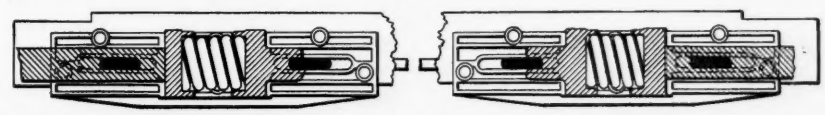


Fig. 3.
Timms' Continuous Draft Rigging.

intended to relieve the strain on the draft timbers. No yokes or tail bolts are required for the couplers. All the castings are made of malleable iron, including the followers.

Rapid Transit in Large Cities.

The March monthly engineering meeting of the American Society of Mechanical Engineers was held March 13 at the house of the Society in New York. Mr. George S. Morison presided. The subject was "Rapid Transit in Large Cities," presented by Mr. William Barclay Parsons, Chief Engineer of the Rapid Transit Commission of New York City. Mr. Parson's paper was illustrated by many lantern slides. An abstract of it follows:

I am a little disappointed that I am unable to show you to-night the plans that the Rapid Transit Commission has decided on, and the reason why I do not show them to you is that the Commission has not decided on them. This is a pretty big subject, and the Commission is acting very properly in going about it slowly and deliberately, and when their mind is finally made up I think you will probably all agree that they have made up their minds on the best thing that is possible. Therefore I shall confine my remarks this evening principally to a description of rapid transit in other cities, and especially the cities of Europe. Before commencing on that, however, I should like to make a few remarks in regard to the problem in New York and as to what the Commission is doing and what it expects to do.

This question is not a new one. The students of Columbia College will recollect that 30 years ago this question was an old one, and the other day I came across an odd little pamphlet from which I will take the liberty to-night to read a few extracts. The pamphlet is written by J. X. L. It is 30 years old. It describes the situation and the pressing necessities for rapid transit then existing. It has a double interest; first of all in itself, and, secondly, because it has on its outside page a little dedication written by Mr. James Laurie, who, as you all remember, was the first one to hold the high position that our chairman holds, that of President of the American Society of Civil Engineers. It is dedicated by him to Mr. McAlpine, who was the third president of the society and the first American member of the Institution of Civil Engineers of Great Britain. J. X. L., whoever he was, I suppose he was probably Mr. Laurie himself, makes a short dedicatory preface to this pamphlet, which is addressed to the Senate Commission on Railroads, and says: "The following statement contains a brief review of the various plans which have been proposed for railroads for the relief of Broadway, in the City of New York; also a description of a new plan to accomplish the same object; also plans for railways suited to the rapid transportation of passengers from the upper to the lower portion of the city." It was dated Sept. 28, 1866. He says:

"A railroad project, in some form or other, for the relief of Broadway, has been before the state legislature and the New York City government for many years.

"The first plan was to lay rails in the central portion of the street. This was first seriously proposed by the friends of the Harlem road. Their efforts, however, to obtain the privilege proved unsuccessful, and in 1832 their tracks were laid in the Bowery, from Prince street to Fourteenth street.

"The extensive introduction of omnibuses about this time put the subject to rest for a while, but the great and rapid increase of their number soon seriously interfered with the use of the street for other vehicles, and for pedestrians, and caused the subject of a railroad again to be agitated, and numerous plans were suggested. It was not, however, until about 1850 that vigorous and continuous efforts were made to get a double track surface road in Broadway, and for which the legislature of the state finally granted a charter in 1852. It was strongly opposed by the owners of real estate, and, although sanctioned by the city government, was eventually defeated in the courts."

Now comes one of the curious parts of this pamphlet. This is in regard to a double track surface railroad in Broadway:

"If the road had been constructed it would not have afforded the relief desired, as, from the concentration of the passenger travel, the cars would have obstructed and interfered with the crossings and the cartage and the loading and unloading of goods to a much greater extent than the omnibuses, the number of which can always be regulated."

Mr. J. X. L., and I regret to say Mr. Laurie and my friend Mr. McAlpine, have long since passed away, also the omnibuses in Broadway, Jacob Sharp, the street railroad, and finally we have the cable railroad in spite of Mr. Laurie's or Mr. J. X. L.'s prophecy to the contrary.

"The next plan was to construct an elevated railroad hanging partly over the sidewalk and partly over the carriageway. This was to be supported on iron pillars; placed near the edge of the sidewalk, 15 to 20 ft. apart, resting on a base 3 ft. in width and spreading out at the top to a width of 5 ft. to carry the railway tracks. There was to be no flooring, nothing but the rails and their supports, stretching from pillar to pillar.

"Two methods of propulsion were suggested. By one, the cars were to be drawn by an endless rope, passing over pulleys, and operated by steam power or Croton water. By the other, the atmospheric system of propulsion was to be adopted. The trains were to pass up on one side of the street and down on the other.

"This burlesque on a railroad would have been an insufferable nuisance to the travel underneath, and would have been liable to frightful and serious accidents.

"Lastly, there is the Patent Elevated Railroad, to be operated by wire ropes or cables attached to drums, driven by steam engines placed beneath the surface of the street at intervals of half a mile. Drawbridges are to be placed at convenient cross streets about one mile apart, in order that loaded wagons of unusual height may pass through; these drawbridges to be opened and shut by the same steam engines that propel the cars. Stairways are to be permitted in the street to reach the cars. It is for such a road as this that the Aldermen and Council of the city of New York lately passed an ordinance, incorporating, substantially, three companies with perpetual rights authorized to build railroads."

It is an astonishing fact that such a railroad was actually once proposed, and that the Board of Aldermen of this city actually passed an ordinance authorizing its construction. Then Mr. J. X. L. goes on and says:

"After so many plans, and so many years of discussion on the subject, it is not probable that any new plan possessing much originality or merit can be brought for-

ward, provided the object to be accomplished has been thoroughly understood and kept in view. Let us therefore inquire what is the object to be attained? What is wanted? What is the problem to be solved?"

In other words, in 1866, the same question that is vexing the Rapid Transit Commission to-day was an old one.

[Mr. Parsons then described briefly the powers of the present Commission, and the studies and recommendations of the Engineer, his advisors and the Expert Board.]

The Commission finally decided on its own responsibility that the street from house line to house line belonged to the city, that is to say, the people, and if the railroad could be built the whole width of the street it would be better to do it, and so the Commission has decided to take the whole street from house line to house line, with the exception of about 5 ft., adjacent to the houses, which would be reserved for light and air space through the basement windows. Broadway, with the exception of one or two places, is substantially a street 80 ft. wide. Therefore, reserving a space of 5 ft. on each side, there remains 70 ft. to be utilized for the railroad. The railroad is to be built as close to the surface of the street as the cable railway and other conditions, such as the grade of the street, will permit. The upper 8 or 9 ft. of Broadway is now practically occupied entirely with pipes, electric wires, etc. In order to bring the railway up close to the surface those pipes and wires have got to be moved, and they will be put into galleries at the sides of the railway, or, if those galleries prove insufficient, additional galleries will be constructed beneath the outer tracks. It is probable, however, that all the pipes can be accommodated in the galleries at the sides, and the sewer can be put at the bottom of those galleries. So that, in case a water pipe leaks, the water can flow through the sewer without requiring any pumping. The railway, it is proposed, shall occupy the middle 50 ft., leaving 10 ft. on each side for the galleries and for the partition walls.

The question of the sewers is an interesting one. It is probably the largest single problem that will come up in the construction of the railroad. That problem has been very carefully worked out in connection with the engineers of the Department of Public Works and engineers of the Rapid Transit Commission, and has been solved to the satisfaction of both. Although I will not be able to show you the plans of the railway itself, I will be able to show you the method in which the sewage will be taken care of.

DISCUSSION.

MR. NICHOLS (Chief Eng. Brooklyn Elevated): Perhaps the most striking illustration we have of successful railway operation in the world is that presented by the Manhattan Elevated in New York to day. In looking over some figures the other day I was rather surprised to see how the working expenses of the London roads compare with those of the Manhattan system in New York—how favorably it compares with it, how much better the working expenses are on the English than on the American line. That may be due to the fact that their expenses for maintenance are so much lighter than they are here. Recently my attention has been called to some figures as to operation in which it was shown that the essential elements differ very radically. For instance, when we were called upon to discuss the figures by the train mile it was shown that they varied, outrageously, one might say, and when it came to be analyzed more closely by the ton mile it was found that the difference was scarcely appreciable, this comparison being made not only between two prominent American elevated lines, but comparing these also with the Liverpool Overhead line operated not by steam, as in this country. but by electricity, and all things considered it was rather a remarkable uniformity, I think in the results as given by the figures. It may be interesting to give the figures for the cost of operation of the two principal lines immediately within our notice, the Manhattan Elevated in New York and the Brooklyn Elevated in Brooklyn, the former covering a mileage of about 35 miles and the latter about 20 miles, speaking now of what is Brooklyn proper, independent of the Kings County line.

It appears from these figures as to operation that while per train mile the operating expenses of the Manhattan road are about 61 cents per train mile, those of the Brooklyn were 38.33 cents. Analyzing that still further and getting it only approximately as we can at the ton mile, it comes to this: that the cost on the Manhattan is 6.15 of a cent, while that in Brooklyn is 5.72, which is practically the same result. It may be interesting to state that the following percentages are found to be approximately correct, and I give them for the Manhattan because they do not vary materially, except in one or two points, from the Brooklyn road. The expense of motive power, including all labor and all fuel and handling of fuel and the like, amounts to 34 per cent. of all operating expenses. The repairs to rolling stock are about 12 per cent. The maintenance of way expenses 10 per cent.; train expenses, 19 per cent.; station expenses, 15 per cent.; general expenses about 11 per cent of the total. Where the maintenance of way on the Manhattan amounts to 10 per cent. of all operating expenses, on the Brooklyn line that maintenance of way amounts to 4 per cent. So that is the greatest difference there, excepting in motive power. Of course, the motive power on the Brooklyn road instead of being 34 per cent. of all operating expenses is about 43 per cent.

MR. M. N. FORNEY: In 1873 I had the honor to serve on a committee that investigated this subject of rapid transit in the Society of Civil Engineers, and at that time I did a great deal of work, and the committee was very much abused for the work which it did. However, the present elevated railroads substantially adopted the recommendations made by that committee at that time, and in fact the report which was submitted, to a certain extent, formed the basis of the action which they took thereafter. That report recommended an elevated railroad. We spent considerable time in the effort to arrive at some conclusion as to the probable traffic which an elevated railroad would carry. I remember using all sorts of persuasion to get from the surface railroads a statement of the number of passengers which they were carrying. Sometimes we succeeded and sometimes we did not. We then made a hypothetical calculation of what the probable earnings would be, assuming that one-third of the seats in the car would be filled, and one-half and three-quarters and some other proportions, and then assuming different rates of fare, although we were afraid to go down below five cents, and it would be quite amusing at the present time to take that report and see the extreme apprehension which was manifested by our committee for fear that we would calculate too high the number of passengers to be carried on the railroad at that time, and probably that committee was in part responsible for the fact that the elevated railroads of the present day were built of so light a character as they are. We did not feel that we could recommend the construction of a railroad heavy enough or strong enough to carry heavy locomotives, because we did not think there would be the traffic to necessitate their use. At that time underground roads were discussed, as they have been ever since, and the conviction arrived at by myself, and I think nearly all the other members of the committee, was in favor of elevated roads, and I am still a believer in elevated roads as against underground.

THE CHAIRMAN: The subject of elevated roads through blocks is one that has been discussed a little, but it has sometimes seemed as if it had not been discussed as much as it should be. The great difficulty, apparently, in the building of a line through the blocks by a private corporation is not so much the doubt whether it will pay as the fact that it requires an immediate outlay of capital, not only enough to build the structure but to buy the land, and it is much easier to raise $25,000,000 with the expectation of six per cent. interest on it than it is to raise $50,000,000 with the expectation of eight per cent. interest on it. There are limits to the amount which can be raised in one lot.

There is one point, however, which I think it would be well to bring out in this discussion. When the elevated railroads were first opened they charged 10 cents fare, except for a little while during the busy hours in the morning and evening. They afterwards changed to five cent fares at all hours. The statement is made, and there is good ground for it, that the five cent fare pays exceedingly well as an average, but it would not pay for long distance travel. Many of the schemes proposed for elevated railroads have been proposed for the purpose of carrying people to the upper end of Manhattan Island, and into the annexed district. Is not one of the greatest drawbacks that we find now in getting capital to build those lines the fact that fares are limited to five cents? I should be glad to hear some expressions on that subject.

MR. G. C. HENNING: As I was one of those who helped to build the elevated railroads, I would like to give a little history. On Third avenue the road ran at first up to Sixty-sixth street, and there was not a house beyond Eighty-fifth street, only between Second and Fourth avenues. On Ninth avenue, when we got to Fifty-ninth street, there was not a house in sight, or anything at all to send a single passenger over that road, except a few of the old mansions considerably up beyond 116th street. Harlem was then a city of itself. With those conditions, of course, not much traffic could be expected. When those roads were in operation, the district near the shops began to build up, and before the roads were finished there were blocks of houses ready to receive their tenants. On the West Side, on the other hand, there were many blocks without houses along Ninth avenue, and before the Ninth avenue road and the Sixth avenue road were finished there were houses ready for tenants all along that line, except on the high ground above Fifty-ninth street and below 122d street, I believe it was. After those roads had been in operation a few years, tens of thousands of people lived along those lines simply because the facilities were there. I believe that if those rapid transit roads were extended so as to have through trains for people living further up than 125th street, not serving the people lower down except at a few points, that then people instead of moving over to Brooklyn and over to Jersey, would stay in the city, and the roads would have an immense population to draw on. Now, nobody can find a seat before 9 o'clock in the morning south of Ninety-third street, and going north in the evening, when the heavy traffic takes place, there is no seat to be found north of Franklin street on either road. I think that from the experience we have had on these structures, and in the development of the Brooklyn Bridge, we can look forward to very large profits very shortly after rapid transit roads are built, which will have faster lines, and, at the same time, provide additional facilities nearer to the centre of the city.

MR. CROES: The chairman spoke of the difference between ten-cent and five-cent fares. On the Suburban rapid transit, which is about four miles long, the fares were ten and five cents. They carried in the first two years there, at ten and five cents, a certain number of passengers. When the fares were reduced to five cents all day long, the traffic was more than doubled and the receipts were very much greater and the expenses no greater. That was a five-cent fare north of the Harlem River. Then a couple of years ago the trolley road was introduced north of the Harlem River, and the Suburban road ran down, as I have been informed. It then passed into the hands of the Manhattan Railroad, and they carried the passengers for five cents down to the Harlem River and five cents south. A bill passed the Legislature requiring the Manhattan railroad to carry passengers over the whole of their line for five cents. At that time the Suburban service had run down so that they were only running two-car trains all day. After the passage of the through-fare bill the Suburban road began to pick up, and they are running now morning and evening five-car trains crowded to their utmost capacity, and those passengers are not all through passengers, but many are Suburban passengers. So that by the introduction of the five-cent fare from the Harlem River to 176th street, the traffic of the Manhattan road north of the Harlem River has increased very largely and more than was to have been expected. I think that the five-cent fare is fixed in the minds of the people of New York. You cannot charge more than five cents on any rapid transit road that is going to be operated in New York for any distance whatever, and I believe that a rapid transit road properly constructed on proper lines could be made to pay, especially if run in connection with existing lines by a system of transfers.

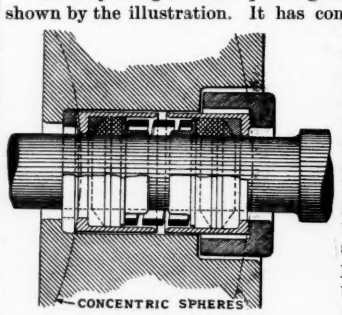
MR. PARSONS: Dr. Emery says that the day will come when electricity as a motive power will be more economical than steam. He is wrong. That day will not come—it has come. One of the speakers to-night referred to the question of the operating expenses of the Manhattan and Brooklyn Elevated railroads as compared with the three electrically operated rapid transit roads, the Liverpool Overhead, the Intramural of Chicago, and the City & South London, and compared the figures in dollars and cents. I have to acknowledge the kindness of the officers of those roads in giving me their figures in getting the coal consumption in pounds independent of dollars and cents. There is no use in comparing the cost of coal in London with the cost of coal in Liverpool, or Chicago, or New York. These five companies have given me their actual coal consumption, and I have had the figures tabulated and published. They also gave me the weights of their trains, so that, as Mr. Nichols stated, we finally have to get down to the basis of the ton mile, and I finally reduced the question of the consumption of coal to pounds per ton per mile. These figures are given in decimals of a pound of coal consumed per ton per mile:

On the Liverpool Overhead the consumption is	.416
On the Intramural	.495
City & South London	.604
Manhattan Road (Ninth avenue) short trains	.609
Brooklyn Elevated, short trains	.661
Manhattan, on the big trains	.928
Brooklyn Elevated, big trains	.526

Analyzing the first five figures—it is really unfair to take into account the Manhattan figures at all—the Liverpool Overhead trains weigh 42 tons, the City & South London 44 tons. Taking the Brooklyn Elevated average train as 63½ tons, we see that the coal consumed on the Liverpool Overhead is .416, and on the Brooklyn Elevated .661. In other words, the consumption of coal in pounds per ton per mile is but two-thirds of that where they run steam locomotives. In Liverpool they burn slack of the cheapest grade that they can buy. On the Brooklyn Road they burn a high-priced anthracite. So reducing it down to the valuation put in dollars and cents, the difference would be far greater than it is when expressed in pounds. That is also regardless of the fact that the Brooklyn Elevated trains weighed half as much again as the Liverpool trains, and the coal consumed per ton per mile does not increase in proportion to the weight of the train. Of course there are certain losses which are entirely independent of the weight of the train. The Brooklyn Elevated train, which weighs 91½ tons, falls down to .526 and .661. The Manhattan weighs 80 tons, the coal consumption is .609, and the 97.1 it falls to .528. So that we see that the coal consumption per pound per ton per mile on an electrically run road, is actually less, considerably less, than on that run by a steam locomotive.

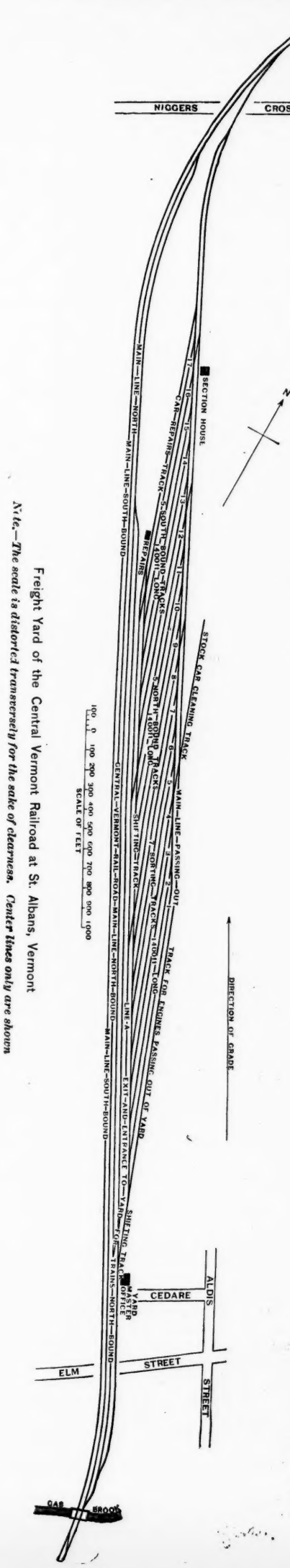
A Self-Adjusting Metallic Packing.

A self-adjusting metallic packing for locomotives is shown by the illustration. It has concentric spherical bearings which will not permit the packing to drop vertically, although it can swivel to any angle. It is claimed that the double packing shown will prevent steam at full pressure from entering the stuffing-box, and that by giving large wearing surfaces the friction is much reduced. A set of this packing has been run six months on a locomotive doing hard work without other lubricant than is in the steam.



The New St. Albans Freight Yard.—Central Vermont Railroad.

The engraving shows the plan of a freight yard built by the Central Vermont Railroad at St. Albans, finished in September, 1893. The drawing has been distorted transversely for greater clearness, and only center lines of track are shown. The scale, therefore, applies only to dimensions lengthwise of the yard.



Freight Yard of the Central Vermont Railroad at St. Albans, Vermont

Note.—The scale is distorted transversely for the sake of clearness. Center lines only are shown

The purposes of the various tracks are pretty fully shown on the engraving. The yard is built on a descending grade of 40 ft. to the mile northward, and is 1¼ miles long. Car tracks are each 1,400 ft., and the total mileage in the yard is 7⅛ miles. There are 56 switches, and 56 frogs, the frog angles being one in seven, the lead 60 ft. from head back to frog. The angle of the tracks is 8 degrees, 10 minutes, and the tracks are placed 13 ft. center to center.

The yard cost about $50,000, and the saving to the company in the economy of handling cars, through it, as compared with former arrangements, is $1,000 a month. Five hundred cars a day, on an average, have been handled through the yard since it was completed, and it has capacity enough to handle from 1,500 to 2,000 cars a day.

Tank Cars for Molasses and Syrups.

Up to within a year or two ago, oil was the only liquid handled in tank cars; to-day the progressive refiners of syrups are rapidly introducing tank cars for the transportation of syrups, molasses and glucose. C. W. Goyer & Company of Memphis, Tenn., were the first refiners to introduce this practice, and to-day their tank cars move to all parts of the United States carrying refined syrups in one direction and glucose in the opposite.

They have recently received from the works of the Memphis Car & Foundry Company the first of a number of model tank cars. These cars are of sheet steel, double riveted, and are made to carry 5,000 gallons of syrup, equivalent to 60,000 lbs. The dome and cap at the top of the car are large enough to readily admit a man, the cars being thoroughly washed out after each trip. A double coil of steam pipe, galvanized, is laid at the bottom of each tank, live steam being used to heat the syrup when the cars are being unloaded, with a view of making it run freely. An outlet 6 in. in diameter is used at the bottom of each tank for unloading, and to this is fastened a pump with which the car can be emptied within 12 or 15 minutes.

Until the introduction of tank cars for handling syrups, barrels holding from 500 to 600 lbs. were used, which entailed a heavy loss to the receivers of both refined as well as crude goods, there being an average of 45 lbs. of syrup to the barrel absorbed by the staves. Again, the expense saved in handling syrups in bulk, as is the case in tank cars, as compared with the cost of handling them in barrels, rolling them in and out of box cars, handling each particular barrel while being emptied, fully justifies the investment in tank cars necessary to transport liquid in this manner.

Goyer & Co.'s cars move from their Memphis refinery to the plantations in the South, bringing in crude Louisiana molasses, and out again to the North and West, carrying raw and refined molasses to St. Louis, Chicago, Omaha, Philadelphia, New York and other cities. The saving to railroads is a large item, inasmuch as they are no longer subjected to numerous claims caused by loss in defective cooperage, or obliged to handle light loads because of box cars not being large enough to furnish floor space for heavy loads when in barrels, while tank cars can always carry a maximum load.

We have recently noted the fact that some of the French roads have built tank cars for carrying wine.

Lake Shipbuilding.

On the great lakes as on the ocean the direction of evolution is steadily toward larger vessels. Several ships that will carry between 4,500 and 5,000 tons of cargo on a draft of 16 ft., are now under construction at lake yards at Cleveland and Bay City, while a contract has been let by a syndicate of vessel owners in Cleveland and Duluth for the building of the largest ship ever planned for the lake trade. It will be 405 ft. long over all, 48 ft. beam and 26 ft. deep, and will be expected to carry not far from 6,500 tons cargo. With the advent of the 20 ft. channel on the connecting waters of the lakes next year, the load of such vessels as there ought to be increased 10 to 15 per cent.

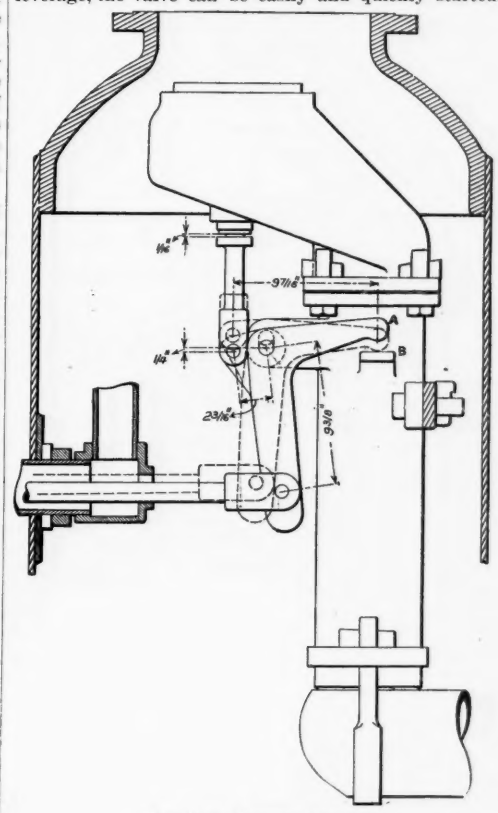
It is the feeling of vessel owners on the lakes that the race is hereafter to the strong alone, and that small carriers can scarcely earn their fixed charges. To this a great part of the present lake shipbuilding is due and not to any demand for additional tonnage. There is now under construction at lake yards or soon to be placed tonnage to the amount of 65,000 tons, besides twelve vessels not for the carriage of freight. Of these latter eight are passenger ships, from the $700,000 North Land down; two are expensive car ferries and two are steam yachts. There are also several tugs building. The cost of these vessels is estimated at about $4,100,000, and nearly every yard of prominence on the lakes is fairly busy. Of course this total is nothing like the capacity of the yards, but is ahead of the expectations of builders and is much more than was in sight a year ago. January, 1894, saw 27,000 tons under construction, with a valuation, including very valuable passenger ships, of about $2,550,000; while January, 1890, there were building 56 vessels at a cost of $7,800,000. That was when steel shipbuilding on the lakes was booming and freights were double what they are to-day.

One of the features of interest in connection with lake shipbuilding is the building of a larger proportionate number of high class lumber carriers than ever before. While the lumber traffic was chiefly between Lake Michigan and Huron ports to Chicago the boats that were too old for any other trade were put in this, but with the removal of the chief shipping ports for lumber from Michigan and Huron to Superior, chiefly at Duluth and Ashland, and with the change in the destination of much of this lumber from Chicago to ports of the east end of Lake Erie, a different type of vessels has been required.

Two vessels for the ocean trade are now under way at the western end of Lake Superior. They are to be taken to the Atlantic the coming summer for the coastwise trade in oils. With deep water to the sea, the future of lake shipbuilding is hard to overestimate.

The Vogt Throttle Valve.

A very ingenious throttle arrangement for locomotives is shown by the illustration. It has been designed by Mr. Axel S. Vogt, Mechanical Engineer of the Pennsylvania Railroad, for use on locomotives. It is always difficult on open large throttle valves, such as are now used on locomotives with high boiler pressure, and generally it is necessary to give a strong, quick jerk to the throttle lever before the valve can be started from its seat. This is inconvenient when moving locomotives on turn-tables or into round-houses. The new device shown in the illustration is so arranged that there is a greater leverage to start the throttle from its seat and a less leverage to continue the opening. This is accomplished by providing a slotted hole for the pivot of the bell-crank, as shown in the illustration. At the start the length of the lever arm is $2\frac{3}{16}$ ins., while the long arm is 9⅜, making a ratio of .233 to 1. By means of this large leverage, the valve can be easily and quickly started.



The Vogt Throttle Valve.

After the valve is lifted from its seat the projecting horn A on the back of the bell-crank comes in contact with the bracket B on the side of the throttle pipe, and the crank takes the position shown in dotted lines in the figure. The end of the horn then becomes the pivot and the length of the short arm of the lever is changed to $9\frac{7}{16}$ ins., and of the long arm to about 11½ ins., making the ratio of the arms, after the valve is started from its seat, .820 to 1. The reduction in leverage is apparent. The slotted hole in the pivot permits the pivot pin to rise as much as is necessary. Those who have used the old form of bell-crank on locomotives having large throttles and high boiler pressures will appreciate the convenience which this device gives.

Movement of Trains at the Boston Union Station. A record of the work done at the electro-pneumatic interlocking tower at the Union passenger station of the Boston & Maine, in Boston, has recently been published in the Boston *Herald*, which shows even better efficiency than appeared from a statement published in these columns March 8. As the number of trains entering and leaving this station is very large, taxing the track facilities in the busy hours of the day, it is necessary to take unusual care to avoid delays; and an exact record is kept of all detentions to trains.

For the week ending March 2 the total number of train movements at "A" tower was 3300, and of these only seven, or one in 470, were delayed. The total detention to these trains was 23½ minutes, or between three and four minutes each, making an average delay for all trains of less than half a second. During the two weeks ending March 9 the number of movements at the two towers, one at the terminal and one at Prison Point, was 38,500, with no delay whatever, except that above noted.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Of course it was to be expected that February gross earnings would be unfavorable; for, added to the general conditions which have prevailed so long, we had in that month very bad weather, and bad weather very widespread. Over great regions of the country the freight traffic was completely blocked for more or less time, and on some roads passenger traffic was stopped for a day or two. On many roads the through passenger traffic was very much interfered with. In fact, this storm was more widespread, was longer continued and was attended by lower temperature, than the famous blizzard of 1888, but fortunately much less snow fell. In the Southern States, however, there were heavy snow falls during the month, extending as far south as Galveston and New Orleans. Even in Mexico the temperature got down to zero. The results, unfortunately, were not limited to loss of traffic in the month of February, for the destruction of fruit, and especially of the orange crop in Florida, has been a very serious matter. The *Chronicle's* reports of February gross earnings are for 131 roads, covering a little over 100,000 miles, the mileage being almost precisely that of the preceding year. These roads lost in the month $718,346, or 2.11 per cent. This is rather comforting, as compared with the loss in 1894, which was $4,654.000, and in 1893 it was $1,322,000 for the month. We judge that, but for the severe weather, February would have shown a slight gain over last year. By weeks, there was a decrease in the first two weeks, a very slight increase in the third week, and an increase of 4.52 per cent. in the fourth week. The grain movement continues to be small. At the western primary markets the receipts of what for four weeks to March 2 were only five million bushels, compared with seven million the year before. The receipts of corn were but six million bushels, compared with 14 million the year before. The loss in all the cereals is about 11 million bushels. Duluth alone shows a gain. The loss at Chicago was especially large, the receipts there having been 8,171,000 bushels this year, as compared with 14,254,000 last year. The live stock and provision movement at that point showed some increase. The Southern roads enjoyed the benefits of a large cotton movement. The receipts at the Southern ports in February aggregated 470,858 bales, as compared with 284,733 the year before. The February decreases over $100,000 are: Rock Island, $224,000; Milwaukee & St. Paul, $179,000; Canadian Pacific, $162,000; Southern Railway, $156,000; Louisville & Nashville, $112,000. Only one road shows an increase of over $100,000—the Missouri, Kansas & Texas—which gained $165,487 as compared with February of last year.

In our last issue we published an interesting account of the discipline on the Indianapolis Division of the Pittsburgh, Cincinnati, Chicago & St. Louis. The improvement that may be effected in railroad discipline by doing away with the time-honored plan of punishing all sorts of offenses by suspension is now so apparent that the value of the change described in Mr. Darlington's paper is coming to be appreciated in many quarters. The pamphlet from which we took this paper contains also the discussion, before the Central Association of Railroad Officers, of a paper on a cognate topic which had been read at a previous meeting by Mr. T. F. Whittelsey, General Superintendent of the Toledo & Ohio Central, who was for many years on the Lake Shore & Michigan Southern. Mr. Whittelsey has also stopped suspensions; in fact, he did so nearly a year ago. This discussion shows that the superintendents and division superintendents who are prominent in this association are fully "up to date" on the subject of discipline. Some points in this discussion are worth repeating. One of the most significant is, that, with a force composed of the right kind of men, and with suspensions abolished, the number of extra trainmen may be reduced to a minimum. This is very desirable, for, as one of the speakers said, the extra list is a constant annoyance. The only plausible reason for having a large extra list is to save the superintendent the trouble of always putting enginemen back to firing and conductors back to braking whenever there is a serious falling off in business, which he must do if his force is large enough to provide for emergencies without employing extra men. But, as was well brought out, this latter is the most equitable method, and the superintendent should put up with the inconvenience. If once this method be determined upon, then the newest men, instead of being classed as extra, and being constantly in doubt whether they will make 5 days or 30 days in a month, will be placed in the regular force, though with the knowledge that if business shrinks they may have to go back to farming for a while and give up their places to men above them. To make a man contented with his job, he should be taken into the regular force if possible; and, as railroad positions are still desirable, this can be done even if the prospect of permanency is somewhat clouded. Another point which we are glad to see was appreciated, was this matter of employing "farmers." The evil of the tramp brakeman seems to be well understood. We hope that these Ohio superintendents will have the necessary courage and backing to put this theory in practice.

A feature of the innovation both with Mr. Darlington and Mr. Whittelsey was the letters from the employees, telling how they liked the change. The sentiment of these letters is perhaps sufficiently summarized by stating that the older and better men like the new plan, and the chief objectors are the extra men. One employee wanted to know if there was no way of wiping out old scores, so that they could start with a clean record. The proposition to enter "credits" for good conduct would accomplish this result. One member advocated the payment of money premiums to employees at the end of the year (it will be remembered that the Fall Brook road gives a $60 premium to each freight conductor who has a clear record), and it was well said that men in all ranks, high or low, appreciate such recognition, even when the sum of money is small. A scheme of prizes for one or two winners in a competition is not so good as one of rewards given alike to all attaining a certain degree of efficiency. This was illustrated by one of the speakers in describing the section masters' prizes on his road. The money devoted to this purpose was divided into first, second and third prizes, but the seven best men were so nearly equal to each other that the manager had to divide the money equally among the seven. The wrong impression made upon an employee by inflicting suspension was well illustrated by the statement of one of the superintendents about an engineman whom he discharged. The inevitable committee who came to get him restored said, when the culprit's poor record was explained to them, "Why, each of those cases has been settled, and they should be wiped out." The loss of time had been regarded by the loser as full satisfaction to the company for the loss of property or material which had been the occasion of the suspension. This is natural enough, although it often happens that a 30-day suspension involving $100 in wages is occasioned by a loss to the company five times as large. To try to impress upon a man the magnitude of his blunder by measuring it in days' wages is a crude method at best.

The Cost of Heating Cars by Electricity.

One of the attractive features of the use of electricity as a motive power for trains is the possibility of electric heating. Steam heating from the locomotive involves more or less trouble from leakage and freezing up, and the cost of repairs is considerable. With electric heaters there is little if any deterioration in the heaters, the current is always ready for use and the devices have reached practical perfection. So far as the troubles of operation are concerned, the electric heater has every advantage; but the cost is much greater than with steam.

Take as an example an elevated railroad train. Careful tests in cold weather with the thermometer about 10 degrees above zero F., have shown that the water, in the shape of steam at 15 pounds pressure, required to keep a car warm when running on the road, with the doors frequently opened at stations, is about one pound a minute. This is the amount that is drained from each car, and is less than is required to heat the car well in the coldest weather. As a rule elevated cars are kept hotter than street cars, just why this is so, is not clear, but it may be that custom has set the pace so that passengers expect to be kept warm in elevated cars.

The heat that is given up by one pound of water in condensing steam at 15 lbs. pressure to water at 212 degrees is about 977 units. This heat being given up in one minute is equivalent to the expenditure of 760,000 ft.-lbs. of energy per minute, or 23 H. P. per car. There is less loss in heat wasted in the case of electric heating; probably 18 H. P. per car would be enough in ordinarily cold weather if reasonable care is taken to keep the windows and doors closed as much as possible.

The coal required to make a pound of steam in the steam locomotive would be about one-sixth of a pound, and therefore 10 lbs. per hour would keep an elevated road car warm if heated by steam from a locomotive. In the case of the electric heater, it will take 21 H. P. in the stationary engine cylinders to give 18 H. P. at the heater. Each horse power will require the use of 2½ lbs. per hour of cheap coal in the stationary boilers of 52 lbs. per hour per car. The cost of the fuel on the locomotive may be taken at $3 a ton, and that in the stationary boiler at $1.75 a ton. This makes the cost of the fuel for steam heating 4.5 cents per hour per car. These figures will be different in different localities. In Chicago the elevated roads now burn a mixture of soft coal and anthracite, costing about $4.50 a ton, and the coal for a stationary plant can be bought for one dollar a ton. This makes the cost of fuel for steam heating 2.25 cents, and for electric heating 2.6 cents per car hour. So far as the cost of fuel is concerned there is little difference, but in one case the heat must be turned into energy in the form of electric current, and when the cost of this operation is considered the comparison gives a somewhat different conclusion.

In the case of the steam heat the total cost per car hour for repairs, maintenance and fuel is not far from 3.75 cents per car hour when coal is $4.50 a ton.

In the case of electric heating the 21 H. P. at the central station requires an outlay of about $1,200 for plant, on which the interest and depreciation is about $100 a year. The cost for labor per horse-power hour in a large plant is about .046 cent. The cost per hour for 21 H. P. is .97 cent. Interest and depreciation at $100 a year must be charged over the heating hours during the year, the average of which is 1,400 hours per car. This gives 7.15 cents an hour for depreciation and interest. The sum is 7.15 + .97 + 2.6, or 10.7 cents per car hour against 3.8 for steam heat, on a basis of comparison most favorable to the electric system.

Another feature of the electric heating plan is the power required. It is 21 H. P. during the cold weather all the time the car is in use, that is, when standing at stations and terminals as well as when running. If a road has 250 cars, this amounts to a continuous load of 5,200 H. P. on the central station. The average power required to haul cars at an average speed of 12 miles an hour with an average of 2½ stations per mile is about 15 H. P. This is the average power, including all the time the car is standing at terminals and at stations and the time during stopping when the motors are not being used. It is seen from this that the power required to heat the cars continuously is greater than the average required to haul them for all day, including the time at stand-still; that is to say, the horse-power-hours for heating are greater than the horse-power-hours for hauling trains, in cold weather. This comparison is of course a special one and the results would be different if the conditions were different, but in a cold climate the horse-power hours for heating would not be likely to fall much below those for hauling, even if the cars were not kept very warm.

In street railroad service, where the cars are not kept so hot, and are not so much exposed, it has been found in Chicago that it takes half as much power to heat the cars as to haul them when running, and when an allowance is made for the heating when the cars are standing, and when motors are not in use, it is found that the horse-power hours for heating are nearly equal to those for hauling.

This comparison does not show that the heating of elevated cars by electricity is impossible, nor that it is impracticable, but only shows that the central sta

tion must be so designed as to take a large additional load, and also that the cost of heating by electricity will be much greater than by steam or hot water storage.

The Progress of Railroad Reorganization.

Progress in reorganization for the last six months has been slow, and, in some cases, very disappointing. The bad outlook and the steady losses in earnings during the past year have made some of the plans of reconstruction hopeless, and necessitated changes in others which throw much heavier burdens on security holders than had been expected. The natural struggle between rival interests, as to which shall bear these new burdens, has blocked advance in a few of the main reorganizations. But on the whole, it is noticeable that the bondholders are now getting the upper hand and are in a position to make the stock take its share of the expenses of reconstruction, and this is one step in the right direction. In most cases the conflicts over these properties are slowly coming to some sort of settlement, and with improvement in earnings, little though it is, the general outlook for successful reorganization is much more hopeful than it was four months ago.

In the reorganization of Atchison, progress is apparently being made in a solid way. After Mr. Little's disclosures upset everything, there was a thorough investigation of the whole property. Mr. Little made his well-known report on the company's finances, and Mr. Moore made for the receivers a detailed survey of the physical condition and estimates of the sums required for renewals and improvements. On this sound basis of ascertained facts the reorganization committee has been working for the past few months, and its plan, so far as it concerns Atchison proper, will, it is said, be formally published within two or three weeks. Its main features, however, are already known, but not officially. The common stock is to be assessed $10 a share, that A and B bonds are to be assessed four per cent., but are to be exchanged for new preferred stock to an amount somewhat above their face value, this excess offsetting the assessment and the accumulated unpaid interest. The old general mortgage is to be refunded on a basis of 75 per cent. in new first mortgage bonds, and 40 per cent. in new incomes, the latter representing the balance of the principal together with interest accumulating to July 1, 1895. The plan has been approved by all the foreign interests, and a syndicate has been organized to underwrite the floating debt.

The Reading reorganization was interrupted in December by the failure of the Olcott-Earle plan. Its fatally weak point was the attempt to save stockholders by shifting the greater part of the burden of reconstruction upon the bonds. On this account the committee could not get support for the plan, and was obliged to abandon it, and the trustees of the general mortgage brought suit for foreclosure at the beginning of this month. Before the conclusion of this suit the committee will present a new plan, which will recognize the fact that its only chance of success must be a heavy cash assessment on the stock. In this road, then, after a long fight, the bondholders have got control of the situation. This fact has already been recognized in the market, as is shown by the strength of the 4s all through last month, in spite of the bad anthracite situation.

The course of Erie reorganization has been disappointing, but not surprising. It became certain early in December that the Morgan committee's plan could not be carried through, because the property was in a more hopeless state than had been supposed. Earnings were very poor, and it is noticeable that the finances of the road have shown little improvement in the last four months. The floating debt is very heavy, and, although the company still pays its interest charges, it is not really earning them. The success of the various Drexel-Morgan reorganizations in the past, notably that of the Southern Railroad, has had its effect on the Erie bondholders. So that recently the Morgan committee was able to announce the assent of its depositors to such modifications of the plan as it might find necessary. In this altered form the plan will perhaps be put through successfully—in fact, it looks as if foreclosure proceedings would be soon commenced. But these new conditions will be burdensome, and the feeling of the market was shown in the heavy selling of the bonds during February, for a large assessment is sure to fall on the bonds as well as the stock.

The Northern Pacific tangle begins to look a little clearer. The fight between the Ives party and their opponents, the Receivers and the Adams committee, is still as fierce as ever, but all the conflicting interests are now well defined, and each is represented by its own committee. Judge Jenkins has recognized them all as parties to the foreclosure suit, and we may look for a fair fight to a finish. What will be left of the property when this long struggle is over is somewhat problematical. It is a noticeable fact that, as the time for definite action comes nearer, the junior securities begin to weaken, and of late there has been heavy selling. The only hopeful feature of the situation is the steady improvement in the earnings of the road, which promises to be more rapid with the approach of spring.

In the case of the Union Pacific all plans hung fire while waiting for Congress to take some action on the Government's debt, which expectation came to nothing. Owing to this, the reorganization committee has disbanded and is returning the securities deposited with it, and it looks now as if this big property would be reconstructed entirely by the old system of foreclosure. Suits for foreclosure have been brought in all the states in which the property lies, non-paying branches have been cut off, and a separate receivership of the main line has been granted, so that, pending foreclosure proceedings, the receivers are now managing the road in the interests of the first mortgage. Under the circumstances the value of the Government's claim looks very uncertain.

The reorganization of the New England is now near successful completion. The burden of the reconstruction has fallen on the stock, which has been assessed $20 on the common stock and $25 on the preferred. The plan has received the assent of practically all the stock and the whole second mortgage; foreclosure proceedings under this mortgage are pending, and the new company has already been incorporated by the Connecticut Legislature. Another favorable circumstance has been the good management of the property under the receivers, as a result of which its physical condition shows a great improvement over its wretched state during the last few years. The history of this railroad has been checkered and its future prosperity is not yet assured; still we may hope soon to see it on a paying basis.

The minor reorganizations are generally progressing steadily, notably the numerous bondholders' committees of the Toledo, Ann Arbor & North Michigan, have coalesced, and are now fighting to keep the stockholders out of the foreclosure suit. When we recall that, at one time, six committees were fighting over this little road, the present state of affairs seems like genuine progress.

On Feb. 6 the Norfolk & Western was added to the long list of roads in receivers' hands. The property had, with great difficulty, kept its head above water during the two last years of depression. Its financial condition, however, is in better shape for reorganization than any of the above-mentioned systems, and if trade continues to improve, as it has begun to do, in the territory of the Norfolk & Western, the prospect of reaching a sound footing may be looked on as good.

Annual Reports.

Missouri Pacific.—The report of this company is for the year ending Dec. 31, 1894, and is for the Missouri Pacific and the Iron Mountain. The mileage covered is 4,992, the only change in the year being the addition of about 4½ miles. The main results of operation are as below:

	1894.	Decrease.	Decrease, per cent.
Gross earnings	$21,800,646	$2,217,693	9.2
Operating expenses	16.483,476	1,773,692	9.6
Net earnings	5,317,170	444,001	7.7
Per cent. of expenses	75.6	0.4	....
Other income	741,439	802,272	50.8
Total income	6,058,609	1,246,273	17.1
Int., taxes and rentals	7,752,517	*1,334,535	
Sundry amounts	239,448	23,024	
Dividends	....	515,623	
Balance (deficit 1894)	1,933,356	2,042,161	

* Increase; interest includes $1,207,041 paid on advances by directors.

The amounts written off against balance of prior income are loss in excess of insurance, burning of Carondelet elevator, $282,784; depreciation in Southwest Lead & Zinc Works, $59,940; depreciation of Wabash 6 per cent. debenture bonds, $2,505,429.

The net floating debt is $4,457,058 for the M. P. and $4,355,700 for the Iron Mountain. The President informs us that the deficiences in revenue have been met by advances from the directors, and that the floating debt is entirely concentrated in the hands of a few directors, and that there is none in the West. In the statement of income we find $1,492,222 advanced by the directors to the Missouri Pacific and $1,247,479 to the Iron Mountain.

The earnings from passenger business, excluding mail and express, were $3,992,580, the decrease in the year having been 13.3 per cent. The earnings from freight business were $15,374,833, the decrease having been 8.5. The decrease in passenger miles was 12.4 per cent., the total having been nearly 179,000,000. There was an actual increase in special and excursion mileage, in commercial mileage and in the commutation business. The increase in special and excursion business is, we take it, quite different from the experience of other roads during the year. The average passenger journey was 32.71 miles, having decreased slightly from the year before. The rate per passenger per mile was 2.233 cents, the decrease being only 1 per cent. The ton mile rate was 0.965 cent, an increase of 4.7 per cent. over the preceding year. The ton mileage was nearly 1,594,000,000, the decrease having been 12.6 per cent. The earnings per freight-train-mile actually increased 8.4 per cent., and per freight-car-mile they increased 2.5 per cent. For the passenger-train-mile and passenger-car-mile earnings decreased 7.8 and 6.8 per cent., respectively.

The greatest item of saving in operating expenses was in conducting transportation. The charge for this item was reduced $888,415, or 12 per cent. The item of motive power was reduced $711,107, or 14 per cent., and the item of maintenance of way was reduced $168,948, or 5 per cent. The charge to maintenance of cars was increased slightly—about $49,000.

The President's report says that the road was improved, and is in better condition than at the beginning of the year. The weather was favorable to maintenance of the road at comparatively low cost.

The floating debt has been accumulating for a number of years, and arrangements have now been made for funding it in ten-year, 5 per cent. notes, secured by deposit of miscellaneous securities now in the treasury. It is believed that this plan will not only provide for present needs, but for future requirements should the present conditions prevail. The President expresses confidence that the floating debt can now be gradually liquidated.

The report is an excellent one in the mass of details which it gives as to matters of operation, earnings and expenditures.

Texas & Pacific.—The report is for the year ending Dec. 31, 1894, and covers 1,499 miles operated. The principal results of operation were:

	1894.	Inc. or Dec.
Gross earnings	$7,383,013	+ $18,719
Op. expenses	5,290,274	+ 72,451
Net earnings	2,062,639	— 53,732
Per cent. op. expenses to earnings	71 95	+ 00 81

The extraordinary fact that gross earnings increased was due to improved freight earnings. The freight receipts were $5,194,510, with an increase of $155,000. The passenger receipts were $1,701,926, with a *decrease* of $117,000. Per mile of road the gross earnings were $4,905, with a slight gain; the operating expenses were $3,529, and the net earnings were $1,376, the loss having been $35.85. The improvement in freight earnings was entirely from length of haul and in the ton-mile rate. The tons carried fell off. The ton-miles were 435,438,518, the gain having been 2,371,082 ton-miles. The rate was 1.19 cent, in 1894 and 1.16 in 1893. The tons carried were 1,746,428; 43,657 tons less than in the year before. A good cotton crop had much to do with this improvement in freight earnings. The cotton carried was the largest in amount on the records of the company, viz., 672,336 bales, against 569,168 the year before. Local freight traffic also showed a valuable improvement. The passenger-miles fell from 71,440,306 to 70,661,358, and the rate fell from 2.55 cents to 2.41 cents.

The President says that the physical condition of the property was improved during the year, and that it has been the policy for some years to devote surplus earnings to betterments. During the year 5,000 tons of rails and fastenings were bought at a cost of $125,144, and the standard rail now for renewals is 75 lbs. per yard. There is still 186 miles of iron rail in the tracks, half of which should be replaced in 1895. Notwithstanding the economies of the year, the charges to maintenance of way were increased by $68,387 to $1,191,862.

The locomotive builders will not find much comfort in the report, as we are told that no new ones will be needed during the year; but at least 500 freight cars must be purchased, and a few passenger cars are needed. Furthermore, "attention is called to the urgent necessity of equipping all freight cars with air-brakes and automatic couplers."

The Ohio Soft Coal Agreement.

The coal operators of Ohio have reached an agreement to regulate the production of their mines, which seems to bid fair to stop the ruinous competition that has prevailed for a long time past, and especially for the past year. A Board of Control has been constituted which will meet in Columbus every week to discuss matters of mutual interest, and to direct the distribution of the coal to be marketed; and twice every month this Board will have a conference with the Ohio Coal Traffic Association, which is composed of the coal-carrying railroads, viz: The Baltimore & Ohio; the Cleveland, Lorain & Wheeling; the Columbus, Shawnee & Hocking; the Columbus, Hocking Valley & Toledo; the Pennsylvania Co., operating the Toledo, Walhonding Valley & Ohio; the Toledo & Ohio Central; and the Wheeling & Lake Erie.

It is said that the distribution of output for the coming year has been agreed upon as follows: Columbus, Hocking Valley & Toledo district, 2,200,000 tons annually; Toledo & Ohio Central, 1,500,000; Wheeling & Lake Erie, 1,000,000; Cleveland, Lorain & Wheeling, 900,000; Baltimore & Ohio, 600,000; Columbus, Shawnee & Hocking, 600,000; Toledo, Walhonding Valley & Ohio, 400,000. This represents a total of 7,300,000 tons, which is less than the output of 1893, but about 1,000,000 tons larger than that of 1894.

This agreement seems to have been arrived at under

conditions favorable to permanency, and the reported harmony shows every sign of being real. During the last year competition has been very severe, and, as usual, one feature of the strife has been excessive expenditures for marketing the product of the mines. While there is no very hopeful ground for expecting to increase the price of coal, it looks as though secret cutting and further depression would be effectually checked.

The chief competitor to be dealt with by the Ohio coal producers and coal railroads, as a whole, is the Pittsburgh district; next to this comes the Chicago market, where the competitors to be met are the Indiana and Illinois fields; and the West Virginia fields are an increasing factor in the market; but the Ohio people have suffered much more at the hands of each other, from their competition within the family, as it were, than from these outside sources. There is, therefore, ample room for an agreement, and great need of a return to regular dealing, without regard to anything that may be done or not done by these outside competitors. If the members all bear in mind the fact that an agreement of this kind has to do with percentages and not with absolute amounts—a point in which the agreement of the anthracite companies affords an example *not* to be followed—they can materially mend their fortunes. If the market shall improve, as seems likely, so as to demand *more* than 7,300,000 tons this year, the prospects are probably good for rational regulation of competition; but if the weekly and monthly comparisons with last year should be unfavorable, instead of favorable, the coal men, like the rest of us, in hard times, would need to use a good deal of philosophical self-restraint.

At the conference at which the agreement was made there was a declaration in favor of the establishment of a joint agency for selling all the coal, but it does not yet appear whether this is to be carried out. The best warrant for the smooth working of the agreement is the arrangement for regular and frequent conferences. If these are faithfully attended by the actual heads of the various local bodies, every serious irregularity should be choked off at its inception.

Chairman Reagan, of the Texas Railroad Commission, has sent to Governor Culberson a letter summarizing the work that has been done by the Commissioners since June 29, 1894, when the United States Circuit Court dissolved the injunction which for many months had prevented the Board from reducing rates. The Governor had made a formal request for information. The number of orders issued by the Board, making or modifying rates, is 142; these are estimated to cover about 50 per cent. of the freight tonnage of the state, and they apply to cotton, flour, grain, coal, paper and paper stock, live stock, stone and sand. Besides these general orders, large numbers of commodity rates of limited application have been issued. In nearly all cases the changes made by the Commission have been reductions, but there have been a few advances. On cotton the reduction is 25 cents a bale, and Mr. Reagan feels sure that the Commissioners have, by this order, saved the people of the state $625,000 on this year's crop. Grain rates have been reduced to enable Texas millers to compete with Kansas and Missouri millers in the Texas market. Much of the Commissioners' time has been taken up in making valuations of the railroads, as required by law, and in hearing complaints of shippers and of railroads. The preparation of the annual report required the collection of a large amount of information and the current work of the office requires extensive correspondence. Finally, it is impracticable for the Commission to do all that is required of it by the laws without a larger force of assistants.

Has any of our railroads the name of Prince Michae Ivanovich Chilkow on its old pay-rolls? He has just been made Minister of Transportation in Russia, and it is reported of him that after having served in the Russian army until 1857, and in the Foreign Office until 1861 he made an extensive tour through Europe and America, and was so impressed with this country that he returned and familiarized himself practically with our railroad service, from track hand to locomotive engineer, finishing his four years' course here as traffic manager. He then worked for a time in a locomotive shop in Liverpool. On returning to Russia he served as superintendent of machinery for 10 years on differen t railroads; and was later engaged under General Annenkow in the construction of the Trans-Caspian railroad. Later he was a member of the Cabinet of the Government of Bulgaria, then went back to central Asia to railroad work, and in 1892 went into the State railroad service, where he was manager of different railroads, and finally became General Inspector of the Russian Railroads. We hope the Prince will do credit to his American training; but we beg to suggest that we have learned something since 1870, which seems to be about the time he served his apprenticeship here, and if he will come back for a while it might be for his own advantage, though, to be sure, it is very hard to get a place in these hard times, and then the contract labor law stands in the way. There have been very frequent changes in this Russian Ministry of Transportation, and the Russian press complains that these changes have greatly hindered its effectiveness. A new organization has long been recognized as necessary. Every Minister has undertaken such a re-organization, but before he had time to carry it through, he has had a successor, when the work began over again.

NEW PUBLICATIONS.

The Proceedings of the Second Annual Meeting of the Traveling Engineers' Association. W. O. Thompson, Secretary, Elkhart, Ind.

This volume contains the reports of committees and the discussion thereon, a list of members and the constitution and by-laws. Quite complete extracts from the report were given in the *Railroad Gazette*. The subjects reported on in this volume are in the main as follows: "True and false economy in caring for airbrakes," "The best means of saving coal," "Cinder and spark throwing by locomotives," "A uniform examination for new men and for firemen before promotion," "Rules for governing the pooling of engines," and "The testing of coal in actual service."

The committees appointed for 1895 are to report upon "A plan for recording the condition of engines and engine performance," "How can traveling engineers improve the service in rating engines according to the load," "How can the traveling engineer assist in preventing black smoke," "How can the traveling engineer reduce the delays caused by hot boxes and bearings," "What is the smallest list of tools that can be carried on engines," "Could not locomotive service be improved if the furnishing of water and coal was left to the locomotive department," "What effect has the manipulation of the throttle, cut-off and boiler feed on the coal consumption," "How can engine and trainmen best instruct and examine men in the use of the air-brake without an instruction car or an instruction room," "The care and manipulation of engine brake equipment from an engineer's standpoint."

This volume can be had from the Secretary, and it contains much that is of interest to practical railroad men.

TRADE CATALOGUES.

The Q. & C. Co. Western Union Building, Chicago, sends us a special pamphlet covering a few tools handled by that company. The line shown is special metal sawing machines, both for shop and field work, including the Bryant rail saw. A grinding machine devised expressly for sharpening the Bryant saw blades is also shown.

Contracting and Quarrying Machinery.—The American Hoist & Derrick Co., St. Paul, Minn.; 58 South Canal St., Chicago; Cincinnati, Ohio, and Havemeyer Building, New York, sends us its 1895 catalogue of contractors' and quarrymen's machinery. It is a pamphlet of 168 pages with alphabetical index, very well illustrated and showing a variety of material. The company says that it is shipping machinery to nearly all parts of North America, and aims to furnish only the safest and most convenient. The first 23 pages of the catalogue are given up to half-tone engravings from photographs, showing derricks in use which are described on later pages. One is a steel-guy derrick with double booms, the mast 130 ft. high, the boom 120 ft., the capacity 10 tons, used on the Chicago drainage canal. Another interesting picture shows tubular derricks run by steam power, in use in erecting the state hall and court house at Salt Lake City. These have masts 80 ft. high, booms 75 ft., and a tested capacity of 5 tons. Another type shown is a stiff-leg derrick with steel mast and boom for handling heavy material through short swings. This has a mast 30 ft. high, boom 40 ft., and a capacity of 20 tons. Hoisting engines, double and single cylinder, are shown, with and without boilers; pile driving machines, mining hoists and stationary boilers are also shown. Hoists are shown especially designed for use with electric motors and others for horse power. The great variety of derricks made by this concern is illustrated in outline diagrams with lists of parts and prices. Spare parts and a few special tools are also shown.

Machine Tools.—Built by Hilles & Jones Co., Wilmington, Del., for the equipment of iron shipyards, boiler shops and bridge works, car and locomotive works. Special machines for working plate and shape iron.

This concern sends a pamphlet of 32 pages, 9-in. × 12-in., showing a number of tools, with no description and no price list. It is simply a collection of half-tone engravings from photographs and of wood engravings. Most of our readers know that this concern makes a specialty of large and heavy machine tools, and in the pamphlet before us there are shown some very powerful punches, shears, planing machines and bending rolls.

TECHNICAL.

Manufacturing and Business.

The firm of Henry C. Ayer & Gleason Co., of Philadelphia, has been dissolved by mutual consent. The manufacture of special tools for railroad repair shops, a line of tools originally introduced by Mr. Ayer, will be continued at his new location, Trenton Avenue Machine Works, corner of Trenton avenue and Adams street, Philadelphia, under the name of Henry C. Ayer.

The Youngstown Bridge Co., Youngstown, O., has been awarded the contract for the structural steel work of the new Lafayette Square Theatre, at Washington, D. C., which will be among the finest in the United States.

The Central Railroad of Georgia has contracted with the Crane Air Brake Co., of Chicago, for the equipment of 200 freight cars with Crane air brakes.

The mammoth pumping station of the Ohio Valley Gas Co. near Burgettstown, Pa., has been completed. This station has six 100 H. P. boilers to supply the engine. The cost of it is $60,000.

The Directors of the Birmingham Rolling Mill Co. are considering an increase of capital stock from $580,000 to $850,000.

The Railroad Supply Co., of Chicago, has recently been organized by W. E. Denison, W. W. Wegg and B. M. Spencer.

The National Stock Car Co. has been organized by W. W. Smith and Lucien H. Green, with a capital stock of $600,000; Chicago Truck & Steel Casting Co., capital stock, $150,000; to manufacture castings; incorporators, George H. Graham, G. G. Taylor and Murray J. Brady; Dunkirk Steel & Iron Co., Chicago; capital stock, $200,000; incorporators, Edward C. Foster, John A. McKeever and Henry L. Wilson; and Murray Pneumatic Railway Gate & Signal Co., of Chicago; incorporators, J. G. McMichael, John W. Murray and P. A. Hurd.

The Pittsburgh Reduction Co., whose plant is at present located at New Kensington, Pa., will put into operation its new plant at Niagara Falls, N. Y., about April 1. The company manufactures pure aluminum and estimates that at the start the new plant will have about three times the capacity of the old one.

Three engines, made by the J. T. Case Engine Co., of New Britain, Conn., have recently been shipped to Moscow, Russia.

The Scarritt Furniture Co., of St. Louis, has recently taken a contract to furnish the Detroit Railway Co. with rattan cross-seats for 75 cars.

The American Steel Foundry Co., of St. Louis, is very busy on recent orders for the Schaffer truck. Among these were 400 for the Hutchins Refrigerator Car Co., and 200 for the Cold Blast Transportation Co. of Kansas City.

The Blackmer & Post Co., of St. Louis, has recently made a contract to supply all of the culvert pipe needed for the Trinity, Cameron & Western Railroad now building between Georgetown and Trinity, Texas. The order will amount to about 100 carloads.

The Masterman Car Equipment Co. has been organized in Oakland, Cal., with $500,000 capital.

The McDougall Air Signal Co., which has just been organized in San Francisco, Cal., has capital stock of $10,000.

The Walker Manufacturing Co. has recently taken a contract for building four 2,000-ton Taylor steam and hydraulic cotton presses. It has on hand a large number of orders for its street railway generators of sizes ranging from 100 to 1,000 H. P., and also for a number of spring-mounted street railway motors of from 25 to 50 H. P. These motors have been on the market only a year, but are giving general satisfaction wherever used.

The Griffin Car Wheel Co., of Chicago, has secured a charter in Colorado, incorporation in that State being necessary by the building of new shops in Denver. The new plant is to be established near Sheridan Heights in Denver, and the excavation work has been going on for some time. This new plant has already been briefly described in this column. The work is being supervised by J. K. Choate, Western Agent of the company, who was formerly General Superintendent of the Union Pacific at Denver.

George B. Mallory, engineer and ship architect, 106 Produce Exchange, New York City, has added to his business ship and yacht brokerage. He has designed and superintended the construction of several large grain elevators and store houses, together with piers 25 and 57, North River, the former being leased by Morgan's Louisana & Texas Railway and Steamship Co. Among other large steamboats, the Connecticut, of the Stonington Line, was designed by Mr. Mallory.

Iron and Steel.

An order was completed a few days ago at the Edgar Thomson Steel Works at Braddock for 1,650 rails of the 100 lb. section of the Pennsylvania Railroad.

The Pioneer Re-rolling Steel Company has been organized with General Otto Falk of Milwaukee as President. This company proposes to undertake the re-rolling of steel rails under an invention of Mr. E. W. McKenna, at present General Superintendent of the Eastern division of the Great Northern Railroad. It is stated that the company has made an agreement to re-roll a lot of rails for the Great Northern Railroad.

New Stations and Shops.

The wood-working shops of the Seaboard Air Line system, which were removed from Raleigh, N. C., to Portsmouth, Va., about one year ago, are to be moved back to Raleigh in a short time.

The Westinghouse Machine Co. will receive bids for its new shops at East Pittsburgh, until March 30. The main shop consists of two parallel and connected builders; forming a structure 223 ft. by 602 ft. Through the center of each building is a runway for 20 ton electric traveling cranes of 60 ft. span. On either side of these runways the buildings are two stories, the second floor forming a gallery overlooking the crane floor. The material of columns, girders and trusses will be soft steel. An additional building 60 ft. by 200 ft. will also be built. Thos. Rodd, C. E., is engineer for the Westinghouse Company, and will have charge of construction. The completion of this work will make a model manufacturing plant—the Westinghouse Air-Brake, Electrical and Manufacturing companies, each separate and com-

plete in a fine new building of its own, yet closely related.

The Shiffler Bridge Works have been awarded the contract for the large building for the F. A. Morton Tin Plate Mill, Baltimore, Md.

A new passenger station is to be erected at Brunswick, Ga., by the Brunswick & Western Railroad, and plans have recently been submitted to the Georgia Railroad Commissioners for their approval.

Interlocking.

The National Switch and Signal Company has been awarded the contract for erecting the first interlocking plant for the Baltimore Tunnel. The machine will consist of 24 active levers and is to be completed and ready for service by April 7. This company has been running its works continuously day and night for the past month and will continue to do so.

The National Switch and Signal Co. has recently received an order for interlocking the crossing of the Indiana, Illinois & Iowa with the Baltimore & Ohio and Lake Erie & Western Railroads, at Walkerton, Ind. The machine will consist of 44 working levers and 8 spare spaces, operating 21 switches, 7 locks, 14 facing point locks, 3 crossing bars and 25 signals. In order to obtain view of all the tracks within the limits of the interlocking, the tower is to be 25 ft. high to the operating floor.

Trolley System for the Baltimore Belt Line.

The apparatus to be used in transmitting power to the 95-ton electric locomotives of the Baltimore Belt Railroad is approaching completion. It was especially designed for the purpose, and may be roughly described as a modified overhead trolley system. That portion of the line upon which electricity is to be employed comprises the Howard street tunnel, and nearly half a mile of open cuts, bridges and embankments. The apparatus, therefore, is adjusted in part to the roof of the tunnel, and in part to a system of towers and overhead trusses, simple, but novel, in construction.

The method of transmitting the current to the motors is unique. A steel trough or box with a slot on the under side is adjusted over the middle of the tracks, this box being one 1 in. × 3 in. inside.

The slot is 1 in. wide, and within the box will play a steel shuttle, from which a heavy cable will carry the current to the motors. This overhead trough is thoroughly insulated, and will carry a current of 12,000 volts.

In the tunnel the apparatus is bolted to the roof. Outside the tunnel, steel latticed towers are set up on each side of the tracks, 30 ft. in height, 4 × 10 ft. at the base, and gradually tapering toward the top. Across these towers is placed a heavy truss extending over the four tracks, and supported by three towers in each instance. These trusses are 150 ft. apart, and over the top of each will pass cables of long steel links from which are suspended wires to support the shuttle box. More than 100 of these towers will be erected, some of them, fastened to the Jones' Falls bridge, requiring a variety of work in their construction.

The electrical current to supply motive power will be brought from the power house below Camden Station by large cable conductors, each equal to a solid copper wire 1 in. in diameter. These will carry the current and distribute it along the line. Separate wiring will be employed for lighting the tunnel and stations when they are built.

The machinery for this purpose is already in position in the power house; the large 2,700 H. P. M. P. S. generators, four in number, are now being set up, and the machinery will be in operation within a few months.

The Belt Line Railroad is now practically completed. All the tracks are laid and ballasted, except for a short distance in the Bolton cut, and over North avenue and Jones' Falls bridge, where only one track is finished. The tunnel is being utilized by the B. & O. Railroad Company for freight service, an ordinary yard engine being used to pull the trains through the tunnel. Preparations are also being made for the construction of the new depot on the east side of the Bolton cut. The plans have been drawn by Messrs. Baldwin and Pennington, and work is to begin upon the structure as soon as the weather will permit.

The Mersey Bar.

The dredging operations on the Mersey Bar have resulted in a depth of 24 ft., at lowest spring tide, for a width of 1,400 yds. It is proposed now to fit up the "Alarm," one of the dredgers, with a water jet apparatus, to be used on the ebb tide to stir up the fine sand and silt on the outer edge of the bar, permitting it to be carried away by the current. Heretofore even the finest material has been raised by scoops.

A Cable Railroad Across Niagara Falls.

The Niagara River Tramway Co., in whose behalf a bill is now pending in the New York Legislature, intends to construct an overhead cable tramway across the Niagara River near the falls. A charter has been granted in Canada, and as soon as the bill has passed the Legislature construction work will be begun. Its promoters hope to have it finished in time for summer traffic. It is intended to erect two steel towers, one on each side of the river, about 20 ft. high, between which the cars will run suspended from cables after the plan of the wire rope tramways already used in Germany. The cars will hold about 20 people, and will be largely of glass, affording a fine view of the falls. Mr. George W. Pound, of Lockport, N. Y., who is one of the directors of the company, says that he feels sure the bill will pass, and that the road will be ready in time for use this summer.

Gas Engines for Barge Propulsion.

The application of the gas engine to barge propulsion has lately been attempted in France. A barge has been built for use in service between the ports of Havre, Rouen and Paris and has been successfully tried. It is built of iron, 98.5 ft. long, and of 300 tons capacity. The engine, of the Simplex type, has two cylinders coupled to cranks at 90 degrees, and connected direct to the propeller shaft through the medium of a coupling, so that either the engine or the screw may be moved independently. A flywheel is fixed on one end of the crank shaft. The gas admission is governed separately for each cylinder, and ignition is effected by an electric spark. The engine is of 40 H. P. and occupies, with the other machinery, a space of 25 tons measurement. The gas is contained in 80 solid drawn steel tubes, 10 in. in diameter, each tube being 16.4 ft. long. Their total capacity is 22 cubic meters of gas under a pressure of 220 lbs. per square inch. These tubes are placed together in battery form under the bridge of the barge and are thus out of the way and also in a safe position. Only one man is required to attend to the machinery.

A number of trials have been made at Havre. In one case, in an hour, with 8 receiver tubes in use, the gas fell from 40 to 12 atmospheres pressure. Again, the engine was run for 3½ hours with 18 tubes in use, during which the pressure fell from 18 atmospheres to 7 kilos. The mean speed made on a run of 72 kilometers was 11.5 kilometers, or 8.6 miles, per hour. The experiment has been judged a complete success, both because of the cheapness and ease with which the boat can be run and of the largely increased carrying capacity allowed by the absence of boilers, coal bunkers and other machinery.

The Manchester Ship Canal.

The half yearly report of the directors of the Manchester Ship Canal to the 31st of last December does not offer much to relieve the discouraging outlook as to the financial results of operation. The mortgage interest is £158,395 for the six months. The net receipts from the ship canal were £10,998, the gross having been £53,593. The Bridgewater undertaking showed sufficient profit to give a balance to the good of £36,870. The total credit balance is £314,083, and after deducting the interest on the mortgage for the half year it remains £155,688. Thus another half year will exhaust the credit balance, leaving nothing thereafter to pay interest, unless there is a much greater increase in traffic receipts than now seems possible. The total receipts for the half year from the ship canal traffic proper were less than £50,000, the increase over the previous half year having been £9,455. In the address of the Chairman, he stated that a new line of steamers had been arranged for to sail direct to the East, and that a numbor of Hungarian mill owners had promised to send flour direct to Manchester by the canal. He said, however, that the question of the payment of interest on the loan capital is the present great difficulty, and some arrangement will have to be made to provide for it. The Manchester Stock Exchange did not seem to find the outlook encouraging, as after the publication of the report the canal shares fell sharply. It is obvious that the day of dividends is nowhere in sight. Meantime, the Liverpool people are bestirring themselves, and it seems possible that whatever may be done to encourage further traffic through the ship canal will be considerably offset by improvements in facilities at Liverpool.

The Eubank Car-Door Guide.

In our issue of May 4 last, page 318, appeared a description of the Eubank burglar-proof car door. The guide for this door was described at that time. It is made of malleable cast iron and has cast on it a spindle, which projects into the sill and is entered in an oblong hole. When the guide is turned one-quarter around, into its normal position, lugs on the spindle engage in the wood, so that the guide cannot be taken off as long as the door is shut, even if the lag screws which hold the guide should be removed. This fitting is now made by the National Malleable Castings Company at its Cleveland works.

The Thames River Bridge at New London, Conn.

A newspaper despatch has lately been going the rounds to the effect that one span of the Thames River bridge has worked eastward eight inches, and that it will be restored to its original position this spring. Regarding this, we have the following from Mr. F. S. Curtis, Chief Engineer of the New York, New Haven & Hartford Railroad:

"There has been some movement in the masonry since its construction, except the pier nearest the New London shore, but nothing more than naturally would be expected. The piers being something like 75 or 80 feet in height, resting on about 16 feet of timber, it is not surprising that there should be some settlement or compression of the material in the foundations. A very slight movement at the bottom would show much more at the top. These settlements not being equal, the masonry has moved somewhat to one side, but not to exceed four or five inches. This has heen growing less and less each year, so that now we think there will be practically no more movement. These small movements have necessitated more or less slight changes in the adjustment of the bridge, which has been made once a year since its completion. As the movement has practically stopped, it has been arranged to readjust the bridge and to do more than in previous years of a permament nature, in the connections for signaling, etc., which we have been waiting for until the masonry stopped settling."

The Johnson Signal Shops to be Sold.

The shops of the Johnson Railroad Signal Co., at Rahway, N. J., are to be sold by the Receiver, who will receive proposals up to March 29. These shops constitute a well arranged and very complete plant for the manufacture of railroad signaling apparatus, and the machinery is all of modern design. The sale will include all the real estate, patents and other property of the company. The Receiver, Edward S. Savage, is prepared to give full information in regard to details.

Rating of Feed-Water Heaters.

Last January certain manufacturers of closed feed-water heaters met in convention in New York and adopted the following resolutions:

That a better understanding among ourselves and also between each of us and our customers, in the matter of rating of feed-water heaters, is much to be desired, do hereby

Resolve, That we believe that the only proper rating for feed-water heaters is one which is based upon the square feet of heating surface contained in the heater. For the purpose of giving practical shape to this belief, we do further

Resolve, That we hereby agree that for the future we will in each and every case, in which we are called upon to make prices upon heaters, state the exact number of square feet of surface which we are offering; to give further effect to this action, we

Resolve, That we will in each and every case state without reservation, both in our printed catalogues and in our specifications, the diameter of the tubes, the number of lineal feet thereof and the total square feet of heating surface in each heater offered.

Resolved, Further, that the Secretary be requested to transmit a copy of these resolutions to every manufacturer of closed heaters in the United States.

And we hereby agree to live up to the spirit and the letter of the foregoing and to bind ourselves so to do by our signatures affixed below.

Resolved, Finally, that the Secretary be requested to invite all closed heater manufacturers of the United States to join this Association and to subscribe to the foregoing resolutions.

Signed, The Taunton Locomotive Mfg. Co. (Makers of the Wainwright Feed-Water Heater); Benj. F. Kelley & Son (Makers of the Berryman Feed-Water Heater); Wm. Baragwanath & Son (Makers of the Baragwanath Feed-Water Heater); The Goubert Mfg. Co. (Makers of the Goubert Feed-Water Heater); The National Pipe Bending Co. (Makers of the National Feed-Water Heater); Robt. Wetherill & Co. (Makers of the Wetherill Feed-Water Heater); Keystone Engine and Machine Works (Makers of the Kensington Feed-Water Heater).

These gentlemen are organized as The Feed-Water Heater Manufacturers' Association, and Mr. Frank A. Thayer is their secretary, at 14 Church street, New York. Concerning the action of the Association, Mr. Thayer says:

The method of rating feed-water heaters has been recently discussed by the American Society of Mechanical Engineers, and the need for a change in existing methods is perfectly evident to anyone who has taken the trouble to give the matter even a slight investigation. The movement which these resolutions indicate is one in the direction of fair and open methods, as opposed to evasion and concealment. It is as much in the interest of the users of heaters as it certainly is in the interest of all makers who do not object to telling the buyer just what they are trying to sell him. Every manufacturer of closed feed-water heaters in the United States, so far as known, has been invited to join the Association and to subscribe to its resolutions. Among the leading manufacturers those whose names appear in the enclosed copy are the only ones who have availed themselves of this opportunity. [The signers of the resolutions above.]

The term horse power, as applied to feed-water heaters is an exceedingly loose and indefinite phrase. The work which a feed-water heater has to do depends upon the number of pounds of water in the shape of steam that an engine requires per hour. A simple engine, of the cheapest grade, may use say 50 lbs. of water per horse power per hour; an average engine will use perhaps 30 lbs. of water, while a high-grade engine will cut the consumption of water down to something like 15 lbs. per horse power per hour. Again, the steam which is used to heat this water will in the case of a simple engine have a temperature of 212 deg., while in the engines of high grade it may have to do its work with a temperature of less than 150 deg. It is evident, therefore, that the term horse power cannot be applied to heaters without some explanation as to what is meant by the term in each particular case."

SCRAP HEAP.

Notes.

The Mobile & Ohio has discharged seven or more passenger conductors.

Railroad mail clerks in various parts of the country are complaining because they have been deprived of their passes, under which they have hitherto enjoyed free transportation not only on their regular runs but to a considerable extent outside of their actual work.

The Brotherhood of Locomotive Engineers is still paying $40 a month each to 97 engineers who left the Lehigh Valley at the time of the strike, and who are still out of work. Over 500 engineers joined in the strike west of Easton, but all but these 97 are said to have gone back to work.

A roundhouse of the Wabash Railroad was burned at Toledo on March 17, and six engines were badly damaged. Two employees and a spectator were killed and 11 employees were injured by the fall of the roof. The employees belonged to the fire department organization that is connected with the shops.

At Niagara Falls one night last week a young man was arrested for jumping upon a train of empty passenger cars and shutting the cock in the airbrake pipe between the tender and the first car. A collision was narrowly averted. At the subsequent investigation it was stated that the same thing had been done several times in that vicinity during the past three months.

It appears that the locomotive engineers on the Union Pacific have for several years maintained a grievance committee of one, who devoted his entire

time to the duties of the office, drawing $2,500 a year salary, but the depression in business has led the members of the brotherhood to conclude that they had better save this amount, and they have "sent the man his resignation."

The Brooklyn Elevated Railroad has notified its 25 or more female ticket agents who work at night that they will be relieved and their places filled by men. It is stated that the most competent wamen will be retained for day work. It appears that at some or all of these stations there is no porter or other assistant on duty at night, so that the ticket agent has to deal with unruly or unpleasant passengers single-handed.

Coal Consumption on French Railroads.

According to a recent article in the *Re ue Technique*, the coal consumed in 1893 on the several railroads of France amounted to 3,782,850 tons, representing a value of about 52 million francs. The Paris, Lyons & Mediterranean road was the largest consumer, as appears from the following statement:—

	Tons.
State Railroads	15,000
Midi Road	272,260
Orleans Road	543,160
Western Road	552,830
Eastern Road	781,580
Northern Road	706,600
Paris, Lyons & Mediterranean Road	975,520
Total	3,782,850

If this whole quantity were put in one heap, of pyramidal shape, then, so the *Revue* figures it out, we would have a pyramid of about 190 feet high, with a base of which one side would measure about 900 feet; in other wards, the dimensions would be somewhat larger than those of the pyramid of Cheops.

Railroad Employees in France.

The socialistic wing of the French Legislature added to the financial budget an amendment designed to reduce the working day of railroad employees to 8 hours, to secure an uninterrupted period of at least 36 hours every week without work, to give an annual vacation of a fortnight with full pay, and a minimum pension of 1,200 francs after 20 years of service, with other burdensome conditions. We have not learned whether or not this amendment was carried, but it indicates the drift of the socialists in the direction of creating special classes in the community.

To Lower the Hennepin Canal Level.

The government engineers have decided to lower the entire summit level of the Hennepin canal by seven feet. By so doing the construction of two expensive locks will be saved, and in addition transportation facilities will be greatly improved. The Summit level commences near Wyanet and extends in a westerly direction for 30 miles. The lowering of the section will improve the feeder service that runs from a point on the Bock River between Dixon and Bock Falls. By doing away with the two locks an hour's time will be saved in transit.

South American Notes.

It is stated that the São Paulo Railroad, of Brazil, has decided to abandon its claim to an exclusive right to the entry to the port of Santos, and is now petitioning for a concession to lay a double track from Santos to Jundiahy.

The municipality of São Paulo, Brazil, is considering plans for an elevated railroad through that city.

The Mogyana Railroad, Brazil, reports gross income for the quarter ending Sept. 30, of $800,000, leaving a net balance of $340,000.

The boundary dispute between Bolivia and Paraguay is reported as settled by an agreement by which Bolivia obtain a water frontage on the Rio Paraguay of 22 leagues, between Fuerte Olimpo and Bahia Negra. Thus Bolivia will be enabled to realize her desire of extending rail communication upon her own territory to an Atlantic port.

The extension of the Paranaguá & Curityba Railroad, Brazil, from Rio Negro to Lapa, in the State of Paraná, has been completed, and will soon be opened to traffic.

The Argentine Government has approved the plan of the Buenos Ayres Western and the Buenos Ayres & Pacific Railroads for a junction at Caballito.

The earnings of the Uruguayan railroads for the second half of 1894, while displaying no great improvement, do, nevertheless, show a small gain all along the line. This would seem to be due to a very general tendency to a change from pastoral to agricultural pursuits on the part of the people. The Central Uruguay, of Montevideo Railroad, the most important in the Republic, reports a gain of $80,000 in gross receipts from $665,000 during the corresponding period of 1893.

Railroad working in Argentine for the latter half of 1894 indicates a steady volume of traffic, in most cases exceeding the amount carried in the corresponding half of 1893. The gross earnings of the Buenos Ayres Great Southern, the leading railroad of South America, were $2,560,000. After deducting working expenses, which were 41.60 per cent. of the receipts, and the fixed charges, there remains an available balance of $835,500, so that the company will be unable to pay its customary dividend of 5 per cent. on the common stock without trenching upon the reserve. Among other important Argentine roads the Buenos Ayres Western received, gross, $1,155,000, and will have an available balance of $925,000, operating expenses on this line, having been 45.57 per cent. Similar returns from other roads are: Buenos Ayres & Rosario, receipts, $1,460,000, net income, $161,000, operating expenses, 52 per cent.; Central Argentine, receipts, $1,610,000; net income, $371,000, operating expenses, 60 per cent.; Buenos Ayres & Ensanada Port, receipts, $290,000, net income, $50,000, working expenses 62 per cent. With the exception of the Buenos Ayres Western, all these roads have an increase of traffic. It will be noticed that the working expenses are uniformly low. This would seem to be due to the fact that the passenger service is not maintained upon an expensive basis; that freight rates are high and labor for maintenance of way comparatively cheap.

The Way They Open a Railroad in Arizona.

Twenty-five thousand people crowded into Phœnix March 12, to participate in the first day's celebration over the opening for traffic of the Santa Fe, Prescott & Phœnix road. Four special trains of private cars, bringing capitalists from Chicago; Youngstown and Cleveland, O. New York, Providence, and other places arrived to take part in the opening. The Chicago delegation was headed by N. K. Fairbanks and George Snyder, president of the National Bank of Illinois. Ten Pullman sleepers ar rived from Denver. Exercises began in the morning with a parade. In line were several bands, 200 workmen, 500 school children, fire department, militia, and a large civic display. The especial feature consisted of 100 Indian school children neatly uniformed and marching steadily, contrasted with 100 mounted Pimas that followed, decked in war paint. Succeeding the procession at a mass meeting on Militia Plaza, greeting was extended to the visitors by Governor Hughs, the Chief Justice, the Mayor, and the Chairman of the Chamber of Commerce. In the evening a reception was extended to the visitors in the rooms of the Governor at the capitol.—*Press Dispatch.*

The Oakland Water Front Suits.

The Supreme Court of the United States has dismissed the bill of the State of California against the Southern Pacific Railroad Company, involving the possession and control of the water front of the city of Oakland, for the reason that it was not a case in which the court had original jurisdiction. "The city of Oakland and the Oakland Water Front Co.," said the opinion, "were so situated, not being parties to the suit, that the Supreme Court of the United States ought not to proceed in their absence. But even if they were present and included within the scope of the litigation, the court could not exercise original jurisdiction and the bill was therefore dismissed." The effect of this decision is that the state must renew its litigation de novo in another tribunal, of which the Supreme Court of the United States has appellate jurisdiction. Mr. Justice Harlan read a dissenting opinion, in which he was joined by Justice Brewer. He said that if the Supreme Court of the United States would not exercise its original jurisdiction in this case it was difficult to see where it would do so. Mr. Justice Field read a brief statement expressing his regrets that the controversy between the state and the railroad company, owing to the limited jurisdiction of the Supreme Court of the United States, could not now be heard and finally determined, for the controversy would seriously affect the interests of both until it was so determined. He expressed the belief that by a proceeding began in the state courts and reaching the Supreme Court of the United States by that route, the state would speedily find a means of ending the controversy.

A Distance-Lock.

The latest frustrator of train robbers is Mr. Marlin, of Kansas City, who has spiked their guns in a most effectual manner. His scheme is simply to apply a time lock to the safe in the express car, and his patent bears the date of Feb. 19, 1895. The time lock is not a time lock, however, the mechanism being designed to deal with miles instead of minutes. Gearing is connected with the axle of the car in such a way that the wheels must roll a certain pre-determined distance before the lock can be opened; and the inventor claims that he can adjust the lock to the gearing with such precision that the lock bar will be withdrawn at a point within two rods of the calculated distance

Buckeye Tickets.

Look Here! Mileage tickets good everywhere! Buy by the dozen and save half. Money refunded if goods do not wear well. Good on all air lines and for foot passage on all roads. A Ticket to New York, San Francisco, or London always in your pocket. Try me and you will use no other.

The foregoing is a prospectus of interchangeable thousand mile tickets which can now be had in Ohio and Indiana, good on the trains of something less than a hundred different railroads. It is not a verbatim copy of an actual circular, but in its general features it conveys a fair idea of the impression one gets by reading the flyers issued by some of the roads in that territory. The Columbus, Hocking Valley & Toledo, the Ohio Central Lines and the Wheeling & Lake Erie issue folders with lists of the lines on which the tickets will be received. We do not find in these lists any mention of hotels where tickets will be received for lodgings or for drinks, but in connection with recent newspaper statements some of the items are suggestive in that direction. In order to make up a long list of roads, the names of various steamer lines on the lakes and on the Ohio River are included, and all of the lists include one or more electric railroads. All of them include the Parmelee Omnibus Company, of Chicago.

These mileage tickets are sold at $20 each, and each of the roads manifests a desire, restrained with suitable dignity, to send tickets by express to all parts of the United States and Canada. If two cents a mile is a satisfactory rate to all the roads in Central Traffic territory, and the selling roads promptly settle with those on which the tickets are used, this little bit of sensationalism may not do any harm; but there is one official who has our sympathy; we mean the auditor, who will have to do a good deal of work for a very small return. And, if the scalpers do not get considerable benefit out of it, it will be a wonder.

R. P. I. Non-Resident Lectures.

R. A. Cairns, C. E., City Engineer, of Waterbury, Conn., delivered a lecture on "Water Supply" before the students of the Rensselaer Polytechnic Institute at Troy, on March 15.

Pig Iron Production.

The monthly report of the production of pig iron compiled by the *Iron Age* shows a decrease in number of furnaces and weekly capacity. March 1 the capacity was 156,979 gross tons; this is 6,412 less than on Feb. 1, and is the lowest since Oct. 1, when it was 151,135 tons. The maximum of recent weekly capacity was 168,762 gross tons on Dec. 1. This had been reached rapidly from 62,517 tons on June 1, the minimum in late years. Jan. 1 was but 350 tons below Dec. 1. May 1, 1893, the weekly capacity was 181,551 tons. Then it fell to October, rose to April and fell again to June 1, 1894. It is said that a number of large furnaces have blown out for repairs. Prices are low and buyers are cautious, taking out small quantities.

Exports of Alabama Iron.

The Tennessee Coal, Iron & Railroad Company is considering the possibility of foreign exportation of Alabama iron. This company is a very strong one, and the Secretary says: "I have become perfectly satisfied that starting as we do with the price about $2.50 for gray forge or No. 3 foundry, below the f. o. b. price of Middlesboro, England, iron, of similar grades, we certainly ought to compete in neutral markets. It will, however, require time and patience to attain this end, for the reason that the vast bulk of ocean tonnage is in the hands of English owners, who will make freight rates to facilitate English exports, and obstruct ours." The Secretary's ideas of the laws of trade seem to be pretty crude; but we hope that he will sell his iron abroad for all that.

Coal Mining by the State in Tennessee.

The coal mine operators of Tennessee have just held a meeting to formulate plans for their mutual protection. The State has bought a large amount of coal land and proposes to employ its convicts in working mines and to put the coal on the market. The danger apprehended by the coal operators is that the price will be put so low by the State that they will be unable to compete in the open market and some of them thus driven out of the business. They hope to prevent the possibility of this by having suitable legislation in their favor. At present the convicts are hired out by the State to contractors and mining companies.

Mexican Street Railroads.

The Valley Railroad of the City of Mexico, a steam railroad, and the Federal District Street Railroad system of the City of Mexico, have just been purchased by a New York syndicate, the consideration being about $8,000,000. The Guggenheimers of New York and Philadelphia are heavy stockholders in the company.

Advance in Miners' Wages.

The long-expected advance in the price of coke is likely to come April 1. The indications that it will come are the announcements by the various companies of increases in the wages of workmen.

Following the increase of 15 per cent. announced last week by the Frick Company, W. J. Rainey has made a similar announcement. The McClure and Oliver companies have also advanced wages and the smaller concerns are expected to fall into line. Furnaces in Western Pennsylvania are taking on large supplies of the coke, most of it going into the stock piles. There is a general belief among furnace owners that the price of coke will advance. Last week the H. C. Frick Company had a greater output than any week during the past year.—*Philadelphia Press*, March 18.

The New Siberian Railroad.

After returning to Vladivostok, I made the trip, as far as it is at present open, by the Ussuri Railway (the eastern section of the Trans-Siberian line) to this hamlet on the Ussuri River. The eastern terminus of the railroad is close to the sea, and the Government deep water pier below the town. The station is large, of dark gray granite, with the architraves of the windows and doors in red brick. Buffets and all else are in efficient working order. The administrative offices are also of stone, spacious and handsome. At present only third and fourth class cars are running, the latter chiefly patronized by Chinamen and Coreans. Each third-class saloon is divided into three compartments with a corridor, and has a lavatory and steam-heating apparatus. The backs of the seats are raised to form upper berths for sleeping, and, as the cars are 9 ft. high, they admit of broad luggage shelves above these.

The engines used at present are old American locomotives. Those which will shortly be introduced, along with all the rolling stock, are manufactured in the Baltic provinces. So also are the rails, the iron bridges, the water tanks, all the ironwork required for stations, and all else. Large workshops, with substantial houses for artisans, have been erected at the prosperous town of Nikolskoye, 60 miles from Vladivostok, for the repairs of rolling stock on this Ussuri section, and are already in full activity. There is nothing about this line of the newness and provisional aspects which distinguish American lines, not even excepting some parts of the Canadian Pacific Railroad. The track is already ballasted as far as Ussuri, about 186 miles; steel bridges span the minor streams; substantial stations, either of stone or decorated wood, with well-kept buffets, at fixed distances, successfully compete as to stability and appearance with those on English branch lines. The tank houses are of hewn stone. The houses for the employees besides being decorative, are most substantial, being built of logs and cement, painted with five coats of paint. Culverts and retaining walls are of solid masonry; telegraph wires have been put up as far as the road is built. The line is worked on the block system. The crossings are well laid and protected.

The aspect of solidity and permanence is remarkable. Even the temporary bridge here over the Ussuri, 1,050 ft. in length—a trestle bridge of heavy timber to resist the impact of the ice—is so solid and massive as to make the great steel bridge, the granite piers for which are already built, appear a work of supererogation. Up to this point there are no heavy cuttings or embankments, and the gradients are easy. The cost of construction is 50,000 rubles (ruble now equals a dollar) per verst (3,500 ft.) This includes rolling stock, stations, etc., and all the bridges, except those over the Amur, Yenesei, etc. The Amur bridge is to cost 3,000,000 rubles. Convict labor has been abandoned, and Chinese act the part of navvies, earning about 80 cents a day. The work is to go on throughout the winter, and at this moment about 200 men are working here in a severe snowstorm.

The line as far as Nikolskoye, 102 versts, was opened thirteen months ago, and earned within a year 280,000 rubles. The last 103 versts have only been open eight weeks, and speed is "strictly limited," averaging nine miles an hour. Engines and wagons are now running 50 versts further than Ussuri, and this distance will be ready for traffic in March. At present 327 versts are open.—*Mrs. Bishop, in St. James' Gazette.*

"Vestibules" for Street Car Drivers.

The Colorado Legislature (the lower house), by the use of the corporation cry and the fear of labor organization, has passed on second reading a bill to require street car companies to construct vestibules of glass, wood, iron or other material to protect gripmen and motormen from the inclemencies of the weather, such cars to be run between November and April. Discussion, revealed clearly that the measure was designed more as a "cinch" bill than to meet a pressing need. In the discussion, a number of telegrams from managers of street car lines in various cities were read, showing the results of attempts to thus protect employees. N. K. Bowers, of Chicago, reported the plan impracticable, and resulting in an increased liability to accidents. J. N. Beckley, President of the Rochester (N. Y.) roads says: "We have vestibules on two-thirds of our equipment. They are not satisfactory, and furnish little protection to motormen as the front window must be kept open. Our employees like open cars better, even in winter weather." H. C Campbell, Portland (Or.) states that, after a thorough trial, vestibules were abandoned as unsafe and inconvenient. P. A. B. Widener, President of a Philadelphia company, declares, after trial, that such a plan is impracticable, and tends to increase the liability to accident.

Hard Times on the British Railroads.

The burdens which the interference of meddlesome busybodies, political wire-pullers and self-advertising members of Parliament have thrown upon the railway companies were admirably depicted by Lord Claud Hamilton, in his speech at the half-yearly meeting of the Great Eastern Railway Co., on Tuesday. The aftermath of the great coal strike, the cold, wet weather and the bad harvest produced results which are disastrous enough; but added to these there was the interference of the Board of Trade with the hours of railway work, necessitating larger outlay. There are indications, however, that the collusion between the wire-pullers and the trade

unions will be attended by consequences distinctly injurious to the railway servants, who were professedly to be benefited. Lord Claud Hamilton announced that 450 men in the locomotive building shops have had to be dismissed simply because there is no work for them to do, and that changes are contemplated in the management of branch lines in the country districts which will enable the company to work them with single locomotives, and to dispense with the services of signalman, station-master and staff. These lines are worked at a loss and however desirous a company may be to retain its old and trusted servants, its shareholders are hardly likely to acquiesce in any policy which involves a great decrease of interest on their investments.—*Transport.*

Ostend-Vienna Express Service.

Train service between Ostend and Vienna has been improved since last summer by the running of a sleeping car express train. The train affords direct communication between Vienna and London in 29 hours altogether, the passage between Ostend and Dover by steamer being made in about three hours. The train is made up of two vestibule sleeping cars, a dining car, and one or more baggage cars, as required. The sleeping cars are divided up into two-seated and four-seated coupes, and the dining car is fitted up with a smoking compartment. A table d'hote is served at noon and in the evening. At Brussels connection is made with trains to and from Paris and Antwerp. Between Vienna and Frankfort the train shortens the time to 13 hours and 52 minutes instead of the 16 hours and 45 minutes necessary by the regular train.

The Algiers Dry Dock.

The sum of $100,000 has been appropriated by Congress for the purpose of commencing work upon the dry dock at Algiers, La., opposite New Orleans. The work, when finished, will cost about $1,000,000. It will be of great value to the Navy Department, since it will no longer be necessary to bring vessels, stationed in or near the Gulf, to the north for cleaning and repairs. In case of war it would become a valuable repair station and supply depot.

4,999 Passes.

The *Journal*, of Topeka, Kans., prints an interview with General Attorney Hurd, of the Atchison, Topeka & Santa Fe, stating that he has issued 4,999 passes to members of the legislature, for themselves and their friends, since the present session began. It appears that even this large figure represents only about half the number of passes issued during the last preceding legislature. Members get passes for every one who comes to Topeka "on legislative business," and apparently for every one who wishes to go anywhere else on that kind of an errand, or any other kind. As usual, the pretexts presented are exceedingly varied. The meanest thing described in the interview is the refusal of the Atchison to grant a senator's request for a pass to enable his stenographer's husband to come from the western part of the State to visit her. Mr. Hurd tells the reporter that next year the railroads intend to shut off the trip passes, giving each member nothing but a season pass for himself and family. This is pretty hard on 'em.

LOCOMOTIVE BUILDING.

The Wheeling & Lake Erie this week has ordered three locomotives.

The Gulf & Interstate Railroad of Texas is in the market for locomotives.

The Rhode Island Locomotive Works are building a six-wheel connected locomotive for the Dominion Coal Co. of Canada.

The Schenectady Locomotive Works has an order for six locomotives from the Cleveland, Cincinnati, Chicago & St. Louis.

The Lehigh Valley Railroad Company has received the first lot of 25 engines from the Baldwin works, of Philadelphia, ordered last January. The company is also reported in the market for six passenger engines, which will be designed after the 656 class recently constructed at the company's shops.

The Cooke Locomotive & Machine Co., of Paterson, N. J., is filling an order for 20 10-wheel engines for the Southern Pacfic Co. Eight of these have recently been shipped. These engines are for freight and passenger service, the difference between the two classes of service being simply in the driving wheels. The order was given last November.

CAR BUILDING.

The Wheeling & Lake Erie has ordered 600 freight cars.

The Pullman Car Co. has delivered five day coaches to the Plant system.

The Savannah, Americus & Montgomery is about to order 300 flat cars.

The Mobile & Ohio has ordered 100 box cars from the Mt. Vernon Car Manufacturing Co.

The Missouri Car & Foundry Co. has an order to build 100 refrigerator cars from Armour & Co., of Kansas City, Mo.

The Memphis Car & Foundry Co., of Memphis, Tenn., is building 600 box cars for the Memphis Fast Freight Line.

The awarding of the contracts for the 2,000 cars to be ordered by the Missouri, Kansas & Texas has been postponed.

The Duluth, Missabe & Northern will probably order some ore cars this spring, but the number has not yet been decided.

The Gulf & Interstate Railroad, of Texas, now building, is in the market for a number of cars. C. J. Jones, of Galveston, is General Manager

The Indiana Car & Foundry Co., of Indianapolis, Ind., has a contract for 110 box cars for the St. Louis, Vandalia & Terre Haute Railroad.

The Campbell House combination car, which was described in the *Railroad Gazette* of Feb. 8, has been tried between Baltimore and Chicago, carrying merchandise westward and stock eastward, with great success. Nine more of the cars are being built at the South Baltimore Car Works for the Baltimore & Ohio.

The Cleveland, Cincinnati, Chicago & St. Louis will soon order 500 new freight cars. It has not yet been decided just when the order will be given out, but the matter is under consideration by President Ingalls and there is not likely to be any important delay in giving out the award. It is said that a number of new passenger cars will also be contracted for shortly, although this latter statement is not verified by the officers of the company. The number is given as high as 20 cars.

BRIDGE BUILDING.

Barrington, R. I.—The Berlin Iron Bridge Co., of East Berlin, Conn., has lately completed for the town of Barrington, R. I., an iron bridge 350 ft. long and 20 ft. wide.

Brooklyn, N. Y.—A bill has been introduced in the New York Legislature authorizing the appointment by the Mayors of New York and Brooklyn of three commissioners, respectively, to constitute with the Mayors a commission to build a new bridge between the foot of Broadway, in Brooklyn, and Grand street, in New York City. This is the structure which the East River Bridge Co., Frederick Uhlmann, President, was organized to erect. That company has not been able to secure sufficient financial support to undertake the erection of the bridge, although it has been organized more than two years. Recently Mayor Schieren interested himself in the plan, and concluded that the bridge should be built jointly by the cities of New York and Brooklyn, and it is understood has secured the consent of the officers of the East River Bridge Co. not to oppose the plan to have the work done by the cities of New York and Brooklyn. It is intended to build a suspension bridge.

Carthage, N. Y.—Gov. Morton has signed a bill appropriating $25,000 for building a bridge over the Black River Canal between Carthage and West Carthage, Jefferson county.

Cincinnati, O.—A petition has been presented to the County Commissioners for a new bridge over Mill Creek on Spring Grove Avenue.

Cohoes, N. Y.—A bill appropriating $4,000 for a canal bridge at Manor avenue, Cohoes, has passed the State Senate.

Columbus, Miss.—Proposals are wanted for constructing a bridge across Black Creek by the County Commissioners at Columbus.

Dufferin, Ont.—A contract has been awarded by the Department of Railways and Canals to the Canada Bridge & Iron Co. for a steel bridge over the Rideau Canal at Dufferin, about 20 miles from Ottawa. The contract price is about $3,000.

Galveston, Tex.—The bridge across Galveston Bay, which is to be built by the Galveston, Laporte & Houston Railroad, from near Virginia Point to Galveston Island, will include a pile trestle over Galveston Bay nearly 11,000 ft. in length, with a draw span over the channel 210 ft. in length. Besides this bridge, the company will build a draw span over Clear Creek, which will be 130 ft. in length, and one over Buffalo Bayou, probably 250 ft. in length. F. H. Peters, of Houston, the Chief Engineer of the railroad, will have direct charge of the work.

Glencoe, Ill.—Proposals are wanted by the town until March 26 for building a 90-ft. iron bridge across a ravine.

Ithaca, N. Y.—A bill is now before the New York Legislature authorizing the Ithaca Common Council to issue $20,000 bonds to construct a bridge across Six Mile Creek from Giles street to a point southerly from the south terminus of Stewart avenue.

Lisbon, Me.—On March 11 it was voted to build an iron bridge between Durham and Lisbon Falls. A committee of selectmen was appointed to take charge of the work

Manchester, N. H.—The New Hampshire Legislature has passed a bill authorizing the city of Manchester to issue bonds not exceeding $200,000 to build a bridge over the Merrimac River.

Missouri Valley Bridge & Iron Works, Leavenworth, Kan.—This company has just completed an important bridge across Atchafayala Bayou, Louisiana, on the Texas & Pacific, consisting of two double cylinders 8 ft. in diameter and over 140 ft. in length. The works have also just furnished 11 plate girder spans from 50 to 65 ft. in length and two through spans 103 ft. in length for the Atchison, Topeka & Santa Fe; 3 spans of 150 ft. for the Santa Fe, Prescott & Phœnix Railway; two spans for the Kansas City, Osceola & Southern Railway, and are about completing the substructure for the new bridge across the Big Black River east of Vicksburg on the Queen & Crescent Railway, consisting of four steel tubular piers from 70 to 80 ft. in length. The contracts on hand for the current year comprise a new railroad bridge across the Arkansas River at Little Rock, Ark., and a new bridge across the Missouri River at Jefferson City, Mo., for highway and street-car traffic.

Philadelphia.—The Pencoyd Iron Works, of Philadelphia, has been awarded the contract for the superstructure of the Pennsylvania Railroad Company's new bridge over the Delaware River near Philadelphia. About 7,000 tons of steel will be required for this contract, and it is estimated that work will be begun about August 1, and that the bridge will probably be completed by the beginning of 1896.

Philadelphia, Pa.—A bridge has been designed which will cross the Schuylkill River, in Fairmount Park, at a point almost directly in the rear of Strawberry Mansion. It will be 1,180 ft. long and will be carried by eight heavy piers. Plans have been laid before the Park Commission who have not as yet reported upon them. The bridge will carry the proposed Fairmount Park electric road, a double foot-way and a highway.

Pittsburgh, Pa.—An ordinance authorizing the construction of a new bridge to Aspinwall has recently been introduced in the Pittsburgh City Council. The project is supported by the Aspinwall Land Co., of which Henry Warner is president, and, in fact, the bridge and land companies are practically identical. E. K. Morse is in charge of the engineering work of the structure, which it is expected will be put under contract as soon as the company secures an ordinance from the City Council,

The Schultz Bridge & Iron Co., of Pittsburgh, began work upon the bridge over the Monongahela River a few days ago.

Redlands, Cal.—It is proposed to build a 120-ft. span bridge at San Timoteo at a cost of from $1,500 to $2,200, either steel or combination.

South McAlester, I. T.—The contract for the superstructure of the Choctaw, Oklahoma & Gulf Railway Company's bridge over the Canadian River has been awarded to the Phœnix Bridge Co., of Phœnixville, Pa. The substructure will be built by McGee, Kahmann & Co., of Kansas City, Mo.

St. Paul, Minn.—The Council has authorized the advertisement for bids for the superstructure of the Como Avenue bridge.

Syracuse, N. Y.—A bill appropriating $10,000 for a bridge over the Erie Canal at Genesee street in Syracuse has passed the State Senate.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Milwaukee & St. Paul, $3.50 per share on the preferred and $1 per share on the common stock, payable April 19.

Keokuk & Western, semi-annual, 1 per cent., payable April 1.

New York Central & Hudson River, 1 per cent., payable April 15.

Western Union Telegraph Co., quarterly, 1¼ per cent., payable April 15.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Canadian Pacific, annual, Montreal, Quebec, April 3.
Chicago & Alton, annual, Chicago, Ill., April 1.
Chicago & Grand Trunk, annual, Chicago, April 10.
Joliet & Chicago, annual, Chicago, Ill., April 1.
New York Central & Hudson River, annual, Albany, N. Y., April 17.
Panama, annual, New York City, April 1.
Pennsylvania, annual, Philadelphia, Pa., March 26, for the election of directors.
Pittsburgh, Cincinnati, Chicago & St. Louis, annual, Pittsburgh, Pa., April 9.
Pittsburgh & Eastern, Philadelphia, Pa., March 29, to vote on an increase of the capital stock.
Sterling Mountain, annual, New York City, April 2.
Toledo, Ann Arbor & North Michigan, annual, Toledo, O., April 17.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Car Accountants' Association* will hold its next meeting at the Palace Hotel, San Francisco, Cal., on April 16, 17, 18 and 19.

The *Association of Railroad Air-Brake Men* will hold its next annual meeting in St. Louis, Mo., from April 9 to 11. The headquarters will be at the Lindell Hotel.

The *General Baggage Agents' Association* will meet in Houston, Tex., April 10.

The *American Railway Association* will meet at the Planters' Hotel, St. Louis, Mo., on April 17.

The *Master Car Builders' Association* will hold its annual convention at Thousand Islands, Alexandria Bay, N. Y., commencing June 11.

The *Master Mechanics' Association* will hold its convention at the same place, commencing June 17. Applications for rooms for both conventions should be made to J. B. Wistar and Charles W. Crossman, both at Thousand Islands, Alexandria Bay, N. Y.

The *International Railway Congress* will meet at the Imperial Institute, London, England, beginning June 26.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the fourth Wednesday of January, March, April, September and October, at 10 a. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets on the first Wednesday in each month, at 8 p. m. The headquarters of the society are at 1736-1739 Monadnock Block, Chicago. The business meetings are held on the first Wednesday at its rooms. The meetings for the reading and discussion of papers are held on the third Wednesday at the Armour Institute, Thirty-third street and Armour avenue.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets in the Carnegie Library Building, Allegheny, Pa., on the third Tuesday in each month, at 7.30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

The *Denver Society of Civil Engineers* meets at 36 Jacobson Block, Denver, Col., on the second and fourth Tuesdays of each month except during July, August and December, when they are held on the second Tuesday only.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second

Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month, at 7.30 p. m. Address P. O. Box 333.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday in each month at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. B. W. Gardner, Monadnock Block, Chicago, is secretary of the association.

The *Association of Civil Engineers of Cornell University* meets on Friday of each week at 2:30 p. m., from October to May, inclusive, at their association rooms in Lincoln Hall, Ithaca, N. Y.

Central Railway Club.

The next regular meeting of this Club will be held at Hotel Iroquois, Buffalo, N. Y., on Wednesday, March 27, at 10 A. M. The report of the Committee on Car Door Fastenings, presented at the January meeting, by Mr. J. D. McIlwain, Superintendent of the Union Car Co., will be taken up for discussion.

Reports by committees whose appointment was ordered at the January meeting will be presented as follows:

Revision of the Constitution and By-laws:—A. M. Waitt Chairman; John S. Lentz, E. Chamberlin, F. B. Griffith, F. N. Hibbits.

To consider the Rules of Interchange, as requested by the Southern and Southwestern Railway Club:—John Mackenzie, Chairman; Robert Gunn, J. R. Petrie.

Freight Claim Association.

At a meeting of the Claim Agents' Association, held in Chicago last week, the following officers were elected: President, John T. Denniston, Pittsburg; Vice-Presidents, W. A. Eldridge, Memphis; A. T. Drew, St. Louis; Secretary and Treasurer, S. A. Mehorter, Pennsylvania Railroad, Philadelphia; Arbitration Committee, J. L. Graham, Savannah; J. M. Arnold, St. Louis, and R. L. Calkins, New York. An alteration was made in the constitution fixing the term of office of each member of the Arbitration Committee at one year. The next meeting of the Association will be held in New York early in August.

Indianapolis Superintendents' Association.

This Association at its annual meeting elected F. G. Darlington, of the Panhandle, President; George W. Bender, of the Big Four, Vice-President, and George Staats, of the Indianapolis & Vincennes division of the Pennsylvania, Secretary.

The Boston Society of Civil Engineers.

The 13th annual dinner of the Boston Society of Civil Engineers was held in the rooms of the Exchange Club in that city on Tuesday evening, March 12. About 150 members and guests were present and enjoyed a good dinner and a jolly time. Mr. William E. McClintock, M. Am. Soc. C. E., was chairman of the occasion. The speakers were Mr. George S. Morison, Pres. American Society of Civil Engineers; Mr. Frank A. Hill, Secretary of the State Board of Education; Hon. George G. Crocker, formerly chairman of the Massachusetts Railroad Commission and now chairman of the Boston Transit Commission; Mr. Osborne Howes, Commissioner on greater Boston; Mr. H. G. Prout, of the *Railroad Gazette;* Mr. Woodward Emery, chairman of the Harbor and Land Commission, and Rev. Thomas Van Ness.

Engineers' Club of St. Louis.

The club met March 6, with Vice President Ockerson in the chair, and 42 members and visitors present.

Prof. J. B. Johnson addressed the Club on the subject of "Wood Structure," explaining in detail the characteristics of the various woods commonly found in the markets, and the methods and appliances used in testing their strength. The lecture was illustrated by stereopticon views showing cross-sections which brought out plainly the characteristics of each wood. It was shown that the the strength of a wood depends upon the proportion of solid to porous matter and that the strength is reduced as the percentage of moisture is increased. After some discussion the meeting adjourned.

General Passenger Agents' Association.

The semi-annual meeting of the American Association of General Passengerand Ticket Agents was begun in New York City on March 19. The only discussion on the first day was concerning the use of safety paper for tickets, the subject having been reported upon by a special committee appointed at the Quebec meeting. It was proposed that the association adopt a standard paper, with a distinctive watermark, but there was much difference of opinion and the whole subject was recommitted for final action at the next meeting, which will be held in Boston in September next. It was stated that the best safety paper would cost only about 10 per cent. more than the kinds now principally used.

W. L. Davidson, of the Florida, Central & Peninsular, was chosen President for the ensuing year, and D. J. Flanders, of the Boston & Maine, Vice-President.

The principal address before the meeting was to be on the second day by Mr. George H. Daniels, of the New York Central.

American Society of Civil Engineers.

At the meeting held on the evening of March 20, 1895, Herbert M. Wilson, M. Am. Soc. C. E., was announced to address the Society on the subject of "The Topographic Survey of the United States," the address to be illustrated by lantern slides.

On the evening of April 3, 1895, H. H. Campbell, M. Am. Soc. C. E., will present a paper on "Specifications for Structural Steel," and the discussion of this paper will be taken up in connection with that of the report of the committee on "Uniform Methods of Testing Materials Used in Metallic Structures, and on Requirements for these Materials to Further Improve the Grade of such Structures." This report will be found on page 55 of the *Proceedings* for January, which will be in the hands of members before the date of the meeting. Advance copies of Mr. Campbell's paper will be sent for purposes of discussion to any member upon application to the Secretary, as well as to those who have requested that their names be listed to receive papers on this subject. The following is an abstract from Mr. Campbell's paper:

SPECIFICATIONS FOR STRUCTURAL STEEL.

In the testing of structural steel much trouble arises from variations which are not due to any inherent qualities of the steel itself, but to differences in the shape of the test piece and in the size and thickness of the member from which it is cut. In order to allow for these variations a plan is here presented which is in the nature of a sliding scale. Several classes of metal are considered, ranging from very soft to hard, and a systematic scheme is given for each. The nature of the plan will be seen from Class VI., which deals with a metal of 56,000 to 64,000 lbs. tensile strength. In each class the phosphorus is limited to a low content, for it is undeniable that it is the most dangerous element found in steel. It reduces only slightly the static ductility, but renders the steel very brittle under shock. Manganese is not so stringently defined since it does not materially affect the physical properties when present in ordinary proportions. Sulphur is also found to be of little injury except in rivets, while copper has no appreciable effect either upon the tensile strength or the ductility. It is specified in most cases that the steel shall be made by the open-hearth process since Bessemer steel has been found to be unreliable. The general provisions concerning the methods of testing which apply to all classes are as follows:

First.—Rivet rods and other rounds are to be tested in the form in which they leave the rolls.

Second.—Test pieces from angles, plates, shapes, etc., shall be rectangular in shape, with a cross-sectional area of about ½ sq. in., and shall be taken so that only two sides are machine finished.

Third.—Should fracture occur outside of the middle third of the gage length, the test is to be discarded.

Fourth.—In case one test piece falls slightly below the requirements in any particular, the inspector shall allow the retesting of the lot or heat by taking four additional tests from the same lot or heat, and, if the average of the five shall show that the steel is well within the requirements, the material shall be accepted.

Fifth.—Drillings for chemical analysis may be taken either from the preliminary test piece or from the finished material, but, if the inspector shall purposely aim to find the point of greatest segregation, the maximum limit of both phosphorus and sulphur shall be raised 50 per cent., *e. g.*, from .04 to .06, or .06 to .09.

Sixth.—The pulling speed of the machine for breaking test pieces shall not be less than ½ in. per minute, nor more than 3 ins. per minute.

Class VI.—Medium Bridge Steel; a substitute for Class V. when greater strength and less toughness are required.

Method of Manufacture.—Acid or basic open hearth process.

Chemical Composition in per cent.—P below .06 in acid steel, below .04 in basic; S below .10; Si below .10; Mn below .65.

Physical requirements as follows:

Shape.	Thickness in inches.	Ultimate Strength. Pounds Per Square Inch. Minimum.	Ultimate Strength. Pounds Per Square Inch. Maximum.	Elastic ratio.	Elongation in 8 ins. Per cent.	Reduction of area. Per cent.	Remarks.
Angles..	⅜	56,000	64,000	63.0	27.0	50	One piece of angle, not over ½ in. thick, shall open out flat, and another close shut without sign of fracture.
" ..	½	56,000	64,000	61.5	27.0	48	
" ..	⅝	55,000	64,000	60.0	27.0	46	
" ..	¾	55,000	64,000	58.5	27.0	44	
" ..	⅞	54,000	64,000	57.0	27.0	42	
Plates...	⅜	59,000	69,000	62.0	22.0	30	On plates under 42 ins. wide, the required elongation shall be raised 1.5 per cent., and the reduction of area 2.0 per cent. On plates over 70 ins. wide, the elongation shall be lowered 1.5 per cent., and the reduction of area 2.0 per cent On tests cut cross-wise from the sheet, the minimum tensile strength shall be lowered 3,000 lbs., the elongation 3 per cent., and the reduction of area 10 per cent. On universal mill plates the allowance for transverse tests shall be 5,000 lbs., 5 per cent., and 15 per cent. Longitudinal strips shall bend double flat; transverse strips shall bend through 180° around a pin 1 in. in diameter. When every plate in the heat is tested, the minimum elongation and reduction of area shall be lowered 5 per cent.
" ...	⅝	57,000	67,000	60.0	25.0	45	
" ...	½	56,000	66,000	59.0	25.0	45	
" ...	¾	55,000	65,000	57.0	24.0	43	
" ...	1	54,000	64,000	55.0	23.0	41	
" ...	1¼	53,000	64,000	53.0	22.0	39	
Eye-bars	¾	56,000	64,000	56.0			The elongation in full length shall be 14 per cent. in bars from 10 to 20 ft. long, 13 per cent. in 21 to 25 ft., 12.5 per cent. in 26 to 30 ft., and 12 per cent. in 31 to 35 ft.
" ..	1	56,000	64,000	55.0			
" ..	1½	55,000	64,000	53.0			
" ..	2	55,000	64,000	52.0			
" ..	2½	54,000	64,000	51.0			

SHAPES.—In channels, beams, etc., the requirements on tests cut from the web shall be the same as for plates between 42 and 70 ins., wide, with the same allowance for difference in thickness. In tests cut from the flange, the minimum tensile strength shall be lowered 3,000 lbs., the elongation 3 per cent. and the reduction of area 10 per cent.

NOTE.—The allowable content of phosphorus may be raised to .08 per cent. for acid, and .05 per cent. for basic steel, if the best quality is not required, but other specifications must remain the same.

At the meeting to be held April 17, 1895, a paper by John W. Hill, M. Am. Soc. C. E., on "Bacteria and Other Organisms in Water," will be presented.

THE ANNUAL CONVENTION, 1895.—The Board of Direction has determined that the Convention shall be held at the Hotel Pemberton, Nantasket Beach, beginning on Tuesday, June 18, 1895, and has appointed a committee of the Board to make the necessary arrangements. A local committee of members of the Society in Boston will also be appointed to assist the Convention Committee. The Hotel Pemberton, which has been secured for the exclusive use of the Society, is at the end of Nantasket Beach, Boston Harbor, and steamers run from the wharf at the hotel to Boston every hour, the distance being about 10 miles.

NOMINATING COMMITTEE.

The following division of the membership into Geographical Districts has been made by the Board of Direction for the purposes of the Nominating Committee:

District No. 1.—The territory within 50 miles of the post office of the City of New York.

District No. 2.—The remainder of the States of New York and New Jersey, and Canada.

District No. 3.—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut, and all foreign countries.

District No. 4.—Pennsylvania, Delaware, Maryland and the District of Columbia.

District No. 5.—Michigan, Ohio, Indiana, Illinois and Wisconsin.

District No. 6.—Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, South Dakota, Washington, Montana, Wyoming, Idaho, Colorado, Utah, Oregon and Nevada.

District No. 7.—Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Florida, Texas, Tennessee, Kentucky, Indian Territory, Oklahoma, New Mexico, Arizona, Arkansas and California.

PERSONAL.

—Mr. H. L. Jewett, who has been Treasurer of the Georgia Southern & Florida railroad ever since that road was built, has resigned. Mr. H. L. Cowern has been appointed to succeed him.

—Mr. Samuel O. Bayless, of Frankfort, Ind., a prominent railroad attorney, has been appointed assistant general counsel for the Big Four system, with headquarters in Cincinnati.

—Messrs. E. Ellery Anderson, Oliver W. Mink and Frederic R. Coudert, receivers of the Union Pacific Railroad, have started on a two weeks' inspection trip over the lines. They expect to meet President and Receiver S. H. H. Clark in Omaha, and will confer with him on several important matters.

—Mr. Phillip J. Slatter, City and District Passenger Agent of the Grand Trunk in Toronto, died suddenly of heart trouble, in that city March 11. Mr. Slatter was about 40 years old and had been in the service of the Grand Trunk upwards of 25 years, nearly all that time in the passenger department.

—Mr. W. T. Reed, of Chicago, recently Superintendent of Motive Power and Rolling Stock on the Chicago Great Western, has been appointed Superintendent of Motive Power of the Seaboard Air Line by Vice President St. John. His headquarters will be at Raleigh, N. C., where the principal shops of the Seaboard Air Line are located. He succeeds Mr. James Maglenn, who resigned last week. Mr. Maglenn became Superintendent of Motive Power last July, when the office was created. Before that time he had been Master Mechanic of the Carolina Central division at Laurenburg, and had held the office nearly 20 years.

—Major John C. Winder, late Vice-President of the Seaboard Air Line system, was the recipient of a handsome testimonial from the railroad men of the S. A. L., at his home in Raleigh, N. C., last Saturday, 16th inst., consisting of a handsome silver service, presented by officials, engineers and other employees. A dinner was given after the presentation speeches were made. Among those present were: Capt. V. E. McBee, Superintendent of Transportation; John H. Winder (son of Major J. C. Winder), General Manager; T. W. Whisnant, Superintendent of Roadway; T. J. Anderson, General Passenger Agent; H. W. B. Glover, General Freight Agent, a large number of engineers and personal friends.

—Col. Martin Van Buren Edgerly, President of the Massachusetts Mutual Life Insurance Company, died at a hotel in New York City this week. He was one of the best known insurance men in this country, and one of the leading men in that business in the State of Massachusetts. His interests, which were largee, were not confined, however, to the insurance business. He was the President of the newly formed Hampden Loan and Improvement Co., of Springfield, Mass., President of the Des Moines, Osceola & Kansas City Railroad, and a Director of other Western railroads, a Director of the Boston & Maine Railroad, and in the work of reorganizing the Atchison, Topeka & Santa Fe property he served on what was known as the Protective Committee.

ELECTIONS AND APPOINTMENTS.

Atlanta & Charlotte Air Line.—At the annual meeting of the railroad company in New York, March 13, Chas. S. Fairchild was re-elected President, William D. Wilmer, Secretary, and George Sherman, Treasurer.

Central of Georgia.—F. L. Drake has been appointed General Agent of this company with headquarters at Memphis, Tenn. He was recently with the Illinois Central as Chief Clerk in the office of the General Freight Agent, and later Agent of the Florida Central & Peninsular at New Orleans.

Columbus, Hocking Valley & Toledo.—The annual meeting of the railroad was held at Columbus, O., March 19. J. W. Ellsworth, of Chicago, and Calvin Morris, of Cleveland, are new directors elected. They are both very large coal operators in Ohio and other fields. Mr. Ellsworth is President of the new general Hocking Coal Company, which now controls all the coal mines on the Hocking Valley road. During the past six or eight months Mr. Ellsworth and Mr. Morris have bought a large interest in Hocking Valley securities. The board now stands as follows: Thomas F. Ryan, C. B. Alexander and Samuel D. Davis, of New York; Calvin S. Brice, of Lima, O.; C. C. Waite, P. W. Huntington and James Kilborn, of Columbus; Calvin Morris, of Cleveland, and J. W. Ellsworth, of Chicago.

Hannibal & St. Joseph.—At a meeting of the Directors of this company and the Kansas City, St. Joseph & Council Bluffs, and their branches and leased lines in St. Joseph, Mo., last week, officers were elected as follows: President, C. E. Perkins; Vice-President, J. C. Peasley; Second Vice-President, George B. Harris; Treasurer, J. C. Peasley; Secretary, W. J. Ladd, and General Auditor, C. I. Sturgis, all officers of the Chicago, Burlington & Quincy.

Hardwick & Woodbury.—The following directors were elected on March 16: E. H. Blossom, St. Johnsbury, Vt.; George M. Powers, Morrisville; E. R. Fletcher, St. Albans; J. V. Dutton, Hardwick; W. H. Fullerton, Manchester; A. B. Thomas, Hardwick, and C. A. Watson, Woodbury, Vt. The board organized by electing G. M. Powers, President; C. A. Watson, Vice-President; E. H. Blossom, General Manager; J. H. McLoud, of

Hardwick, Vt., Treasurer, and Charles L. Sanford, of Hardwick, Clerk.

Kansas City & St. Louis.—The stockholders of the company elected the following directors at a meeting held in Kansas City, Kan., last week: Theodore C. Bates, S. M. Crosby, Francis Amory, and E. W. Burdette, of Boston; Stephen Salisbury, of Worcester, Mass.; T. Atwater Barnes, of New Haven, Conn.; H. E. Ballard, of Holliston, Mass.; Arthur C. Paine, of Portland, Me.; W. E. Burns, of Baltimore, Md.; W. S. Walcott, of Utica, N. Y.; Webster Withers, Walton Holmes, and Thomas R. Morrow, of Kansas City, Mo. The directors elected Theodore C. Bates, President; Stephen M. Crosby, Vice-President; Francis Amory, Treasurer; Arthur C. Paine, Secretary, all of Boston; Webster Withers, Managing Director and Assistant Treasurer. The company is a reorganization of the Winnes company, which did some work on a bridge across the Missouri River at Kansas City several years ago.

New Orleans & Western.—The following officers have been elected for this new company: Armitage Mathews, President; Charles B. Beasom, Vice President, and Charles W. Davison, Elmer B. Yale and Elmer Cornwell, Directors, all of New Orleans.

New York & New England.—The directors of the company met at the Manhattan Trust Company's offices, New York city, last week, and re-elected J. T. Odell Vice-President; George B. Phippin, Treasurer, and J. W. Perkins, Secretary.

Ohio Southern.—William J. Everett has been appointed cashier and paymaster of the road, vice William F. Doyle, resigned. Mr. Everett was formerly with the Southern Railway Company at Knoxville, Tenn.

Pennsylvania.—The present Board of Directors of the Pennsylvania Railroad Co. has been nominated for election on March 26. The present Board is as follows: George F. Roberts, Alexander M. Fox, Alexander Biddle, N. Parker Shortridge, Henry D. Welsh, William L. Elkins, H. H. Houston, A. J. Cassatt, C. A. Griscom, E. B. Comeges, Amos R. Little, W. H. Barnes, George Wood, Frank Thomson, John P. Green and Charles E. Pugh.

Peoria & Pekin Union.—The annual meeting of the Railroad was held at Peoria, Ill., on March 12. Joseph Ramsay, Jr., resigned as director, and C. E. Schaaf, of Cincinnati, formerly General Manager of the road, was elected his successor. M. E. Ingalls resigned as a director, and E. F. Osborne, of the Big Four, was elected to succeed him. The other directors are: W. J. Lewis, for the Peoria, Decatur & Evansville; H. S. Baldwin, for the Chicago, Peoria & St. Louis, and C. M. Hays, of the Wabash. Joseph Ramsay, Jr., retired as President, and C. E. Schaaf, assistant to President Ingalls, of the Big Four, was selected his successor.

San Francisco & San Joaquin Valley.—President Claus Spreckels, of San Francisco, announces the appointment of Alexander Mackie, formerly with the Atlantic & Pacific Railroad, at San Francisco, as Secretary of this company which is undertaking the building of a railroad through the San Joaquin Valley in California. W. B. Storie, Jr., has been appointed Chief Engineer.

Seattle, Lake Shore & Eastern.—A. D. Scroggy has been appointed General Freight and Passenger Agent of this road.

Wisconsin Central.—J. S. Tebbets has been made traveling passenger agent of the Wisconsin Central to succeed Charles B. Kinnan.

RAILROAD CONSTRUCTION,
Incorporations, Surveys, Etc.

Baltimore & Cumberland.—Preliminary arrangements for the construction of the railroad are now announced to have been finally completed and work is to begin as soon as the weather will permit. Although having a separate charter, the line will really be an Eastern extension of the West Virginia Central & Pittburgh, which guarantees both principal and interest on the bonds issued for the purpose of construction. The line is projected from Cumberland to Hagerstown, Md.

Brigantine Beach.—Engineers are surveying a route from Pomona, N. J., the present junction of the Brigantine Railroad to Egg Harbor City, about five miles. The work is under the supervision of George H. Cook, of New York, who is heavily interested in the railroad, against which foreclosure proceedings are pending, and which will soon be sold.

Carpentersville, Elgin & Aurora.—Articles of incorporation have been filed in Illinois by this company. The principal office is to be at Elgin, and the capital stock is fixed at $50,000. The company is organized to build a railroad from a point in Dundee Township, in Kane County, to a point in Aurora Township, in the same county. The incorporators and first board of directors are Alfred B. Church, David B. Sherwood, William Grote, James B. Lane, E. Dunbar, Waldron, and George M. Peck, all of Elgin, Ill.

Chicago, Indiana & Eastern.—Frank Root, as President of the railroad, now under construction between Muncie and Peru, Ind., through Fairmount, has delivered to the Illinois Trust & Savings Bank of Chicago a trust deed covering all the right of way, grade and other property of the company. The road has been largely built with subsidies, and, these being exhausted, the company is borrowing money from Chicago capitalists. The deed is in effect a mortgage at $15,000 a mile on 100 miles of the uncompleted line, the funds being advanced as construction progresses.

Colorado, Wyoming & Great Northern.—President Carpenter returned from Philadelphia to Grand Junction, Col., last week, announcing that the bonds had been sold, and that this week work would begin upon the widening of the grade of the Little Book Cliff line to standard gage. A contract for the first 75 miles of the new line beyond Grand Junction will be let at once, which will complete the line as far as Rangely, to which point the company expects to have cars running by August. Bridge work will be started along the entire route, so that no delays in completion of the work shall occur.

Columbus, Hocking Valley & Athens.—Work was begun this week on part of the right of way of this road in Fairfield County. The purpose evidently is not to continue the work to other parts of the right of way, but this piece of ground is in dispute between this road and the Columbus, Hocking Valley & Toledo, and the intention is to lay a firm foundation to claim ownership.

The first decision in the suits to prevent the construction of the road along the Hocking Canal was given in favor of the company by the Common Pleas Court at Columbus, O., on March 18. The canal was abandoned and leased to the company by the last Legislature, and the suits involved the question of the right of the State to dispose of the canal property without first obtaining the consent of Congress, which in 1828 granted to the State thousands of acres of land to aid in building the canal system. The plaintiff contended that this was a contract that could not be abrogated by an act of the Legislature. The court held that individuals could not maintain an action, as the United States must be complainants if the Government objected to the abandonment of the canal. The law was declared valid, and every point decided in favor of the company. The case will be appealed to the Federal courts, as stated above.

Farmington, Waterville & Wiscasset.—W. F. P. Fogg, of Waterville, Me., and others, have recently applied to the Maine Legislature to secure a charter for this railroad company. They propose to build a line from Farmington easterly to Waterville, a distance altogether of about thirty miles. The company will be authorized to use either steam or electricity for motive power. The line will pass through the towns of Oakland, Smithfield, Mercer and New Sharon to Farmington. The incorporators include, H. B. Goodenough of Brighton, Mass., V. B. Mead of Boston, N. B. Beal of Phillips, W. F. P. Fogg of Waterville, P. H. Stubbs of Strong, and Daniel M. Bonney of Farmington, Me.

Fremont, Elkhorn & Missouri Valley.—The officers have been urged to undertake an extension of its line from the stockyards at Middle Creek, two miles north of Belle Fourche, nearer the center of the great stock ranges of southeastern Montana. This extension carries an immense number of cattle, and the owners want the line brought nearer the mountain grazing lands. It is claimed that 65,000 head of cattle were shipped from the Midd'e Creek yards last season. Resident Engineer F. Haines and a party of surveyors have left Belle Fourche to run a preliminary line from the Middle Creek yards to a point on the Little Missouri River about 40 miles northwest.

Gulf, Beaumont & Kansas City.—Track laying on the extension of the railroad north from Buna, Tex., the present terminus, is now fully under way and is progressing at the rate of nearly a mile a day, and over seven miles have been completed so far.

Hardwick & Woodbury.—The organization of this new Vermont railroad was completed at a meeting of the projectors last week, and directors and officers were elected, as noted in another column. The railroad as projected is eight miles in length, and is to extend from Hardwick, Vt., a point on the St. Johnsbury & Lake Champlain Railroad, south to the granite quarries at Woodbury. No surveys have yet been made, but it is expected that this will be done immediately and that the work will be ready for contract about May 1. The construction will be side cutting the entire distance and will not include any bridge work.

Lake Street Elevated.—The town of Cicero has granted an ordinance for a western extension of the elevated structure through the town limits, and the ordinance has been accepted by the company. Plans and specifications for a mile of road have already been drawn up, and contracts for the construction will be let at an early day. It is expected to have the road running to Austin avenue by the first of next year. In order to raise the money to build this extension, another issue of bonds will probably be necessary, but under the terms of the mortgage as amended in accordance with the reorganization agreement, referred to in another column, the amount can only be just sufficient to cover the actual cost of construction.

Minneapolis, St. Paul & Ashland.—A reconnaissance of the proposed line to Lake Superior has been made by S. B. Fisher, formerly Chief Engineer of the "Soo" Railway Co., and a good route, with grade of 40 ft., was found through a country which presents no serious difficulty to railroad construction, except at the crossing of the Penobee Iron Range. The line crosses the North Wisconsin branch of the C., St. P., M. & O. at the large lumber points, Shell Lake and Hayward. It is not yet certain when the company will undertake active operations, but this will be decided within the next 30 days. It is the intention to build through to Lake Superior, 145 miles from St. Croix Falls, leasing trackage right from St. Croix Falls to St. Paul and Minneapolis. C. H. Pratt is Secretary at Minneapolis.

New Roads.—Applications have been made for charters for the Ohio River, Knoxville & Tidewater Railway, and for the Knoxville. Terminal & Belt Railroad. Charles J. Allison, of Girard, O., has been appointed Chief Engineer.

A standard gage road is to be built from Redding, Cal., to the Iron Mountain copper mine.

Oregon City & Wilhoit Springs.—This company has been incorporated in Oregon to build a railroad in Clackamas County, the incorporators being F. K. Arnold, C. H. Canfield, H. H. Johnson and T. L. Porter, of Oregon City, Or.

Plymouth County.—Surveyors are busy making the final location of the line of this railroad in Plymouth County, Mass. The length of the proposed line is 25 miles, and will pass through the stations of Brant Rock, Hatchville, Norwell, Assnippi, Ridge Hill, Queen Anne's Corner, Liberty Plain, South Hingham and North Pembroke. It will furnish for the northern and central portions of Plymouth County a shorter and more speedy route to Brockton, the county seat of Plymouth.

Santa Clara Valley Railway & Navigation Co.—Articles of incorporation of this company have been filed at San Jose, Cal. The company intends to build a railroad from Gilroy to San Jose, thence to Palo Alto, a branch to Los Gatos and a branch to Alviso. The estimated length of the road is 75 miles. There will be a steamer line running from Alviso to San Francisco. The principal place of business is San Jose.

Thurber & Llano.—The project for a railroad to connect the coal mines at Thurber, in northwestern Texas, with the Texas Central Railroad to the south, has been developed far enough to lead the projectors to apply to the state for a charter for the railroad. Col. H. N. Smith, of Thurber, who is the chief promoter of the line, has secured the entire right of way for the line and large local subscriptions, and is now having incorporation papers prepared. The railroad will be about 20 miles in length from the mines in Thurber south to Stephenville, Tex., where connection will be made with the Fort Worth & Rio Grande. It is said that a conditional agreement has been made with a firm of Philadelphia contractors to complete the railroad.

Toronto, Hamilton & Buffalo.—The extension of the line east of Brantford into Hamilton, Ont., a distance of something like 20 miles, was expected to be completed this week. This will give a line of about 40 miles ready for operation, the line west of Brantford to Waterford, 18 miles, having been opened for traffic for a year or two. W. R. Woodard, of Hamilton, is the Manager of the company.

Trinity, Cameron & Western.—The officers of this company announce the letting of a number of very important contracts involving great sums of money, something like $3,000,000, according to their own estimates. They say first that they have awarded to J. A. Ware, of St. Louis, and J. S. McNamara & Co., of San Antonio, both responsible firms of railroad contractors, a contract for grading 130 miles of the railroad east of Georgetown to Cameron and Trinity. The Illinois Steel Co., of Chicago, was given the order for rails and track fastennings for this number of miles of railroad; the Hopkins Construction Co., of St. Louis, the contract for 11 steel bridges on the line, and W. E. Carroll, of Dallas, a contract for pile work and wooden bridge structures. Contracts for equipment also are reported to have been given out.

Union Pacific, Denver & Gulf.—Receiver Trumbull has decided to replace the 10 miles of track between Denver and Pueblo, with a heavier section of rail, and also intends to relay the 10 miles of track between Fort Collins and Loveland, Col. The grading on the short connection between Trinidad and Forbes Junction has been completed by Chief Engineer Bussell. No further work will be done on this line until a decision has been made by the United States Court in the dispute with the Denver & Rio Grande regarding the trackage contract for the line between Denver and Trinidad. The building of the line between Trinidad and Forbes Junction was undertaken some months ago when Receiver Trumbull secured permission from the court to build a new line between Denver and Trinidad, if the Denver & Rio Grande refused to reduce the rental heretofore paid by the Union Pacific, Denver & Gulf for the use of that company's tracks between those two points. The work to Forbes Junction was undertaken because it would be available as an important branch of the Union Pacific, Denver & Gulf, even if an amicable agreement is made with the Denver & Rio Grande in regard to the trackage contracts.

White River.—Articles of incorporation of the company were filed at Denver last week. It has a capital stock of $350,000. The incorporators are A. C. Drumm, of Denver; E. Marshall, H. J. Hay, I. N. McBeth, and William Kinnison, of Garden City, Kan.; W. F. Teagarden, of Craig, Col.; Isaac Baer, of Leadville, Col.; and F. E. Sheridan, of Meeker. The object of the company is to construct and operate a railroad from New Castle, in Garfield County, to Meeker, in the White River country, a distance of 50 miles. The road will open up a rich mineral country, and the cattle and agricultural region of White and Bear Rivers. A reconnoissance of the route has been made by F. Meade, of Pueblo, Col.

GENERAL RAILROAD NEWS.

Atlantic & Pacific.—The New York committee of the four per cent. guaranteed trust bondholders, in association with the committees at Amsterdam and Frankfort-on-Main, holding about $16,000,000 of the above bonds, as a preliminary to reorganization, has requested the Mercantile Trust Co., as trustee, to offer for sale the underlying six per cent. first mortgage bonds of the Western and Central divisions of the Atlantic & Pacific Railroad, held as collateral for the four per cent. bonds. The sale is announced for April 15, 1895.

Central of Georgia.—The reorganization plan is announced as practically completed, fully providing for the floating debt and all obligations. The new securities to be issued to take up debts are $7,000,000 50-year first mortgage five per cent. bonds, $13,000,000 50-year four per cent. consolidated mortgage bonds (which may be increased for betterments $500,000 annually for four years), and a general mortgage of $4,000,000 at four per cent., a first lien on the Savannah & Western and Macon & Mobile Railroads (which may be also increased $1,000,000 for betterments). The other securities are $5,000,000 first preferred incomes, $8,500,000 seconds and $4,000,000 thirds, with $5,000,000 common stock. The present securities that will be left undisturbed are the Ocean Steamship Co.'s firsts, $1,000,000, and the collateral trust mortgage of $4,880,000. The Mobile & Girard first mortgage of $1,000,000 is to be increased or renewed so as to fund all past due interest. The new company will acquire title to the property now covered by the first mortgage on the Savannah & Western, the Chattanooga, Rome & Columbus, the Macon & Northern, the Montgomery & Eufala, the Columbus & Rome, the Savannah & Atlantic. It is proposed to try and procure leases of the Southwestern Railroad and the Augusta & Savannah. Payment of the floating debt of the Central of Georgia, and the tripartite bonds, with interest, is secured. The plan further provides that the Savannah and Western and the Chattanooga, Rome & Columbus shall be released from any claims on the part of the Central of Georgia.

Charleston, Cincinnati & Chicago.—A decision has just been announced by the courts by which $75,000 of bonds issued by Johnson City, Tenn., to this company, have been cancelled. The court held that the issue was in excess of the limit allowed to towns by statutes, and also that the city had no authority to issue bonds to a foreign corporation, the "Three C's" not having been incorporated under the laws of Tennessee at that time. An appeal to the Supreme Court is probable.

Columbus, Hocking Valley & Toledo.—The annual report makes the following comparisons:

	1894.	1893.	Inc. or dec.
Gross earnings	$2,698,699	$3,270,362	D. $571,663
Oper. expenses	1,538,896	1,901,432	D. 362,536
Net earnings	$1,159,803	$1,368,930	D. $209,127
Other income	.....	19,000	D. 10,000
Total income	$1,159,803	$1,378,930	D. $219,127
Fixed charges	1,051,229	1,015,941	I. 35,288
Balance	$108,574	$362,989	D. $254,415
Div. pfd stock	100,000	100,000	.....
Surplus	$8,574	$262,989	D. $254,415

Chicago, Milwaukee & St. Paul.—The directors last week declared a semi-annual dividend of one per cent. on the common stock, a reduction of one per cent. The regular semi-annual dividend of 3½ per cent. on its preferred stock was also declared. Vice-President Bond, in referring to the action on the dividend, said that the board was unanimous and there was no question what ever about the declaration of one per cent. on the common. "Our dividend policy is not decided as to the earnings of either six months of the year. We really earned in the first six months of the fiscal year 1½ per cent. on the common stock. The present action does not make any precedent as to the amount that will be declared for the last six months of the year. At our next

dividend meeting we will know where we stand. At present we can do no more than wait for the crops."

Denver, Leadville & Gunnison.—Henry Budge, Charles A. Peabody, Jr., and Henry De Coppert, a New York bondholders' committee, have brought action in the Supreme Court at New York to recover $1,746,340 from the Union Pacific Railway Company on bonds of that road, known as the collateral trust 4½ per cent. bonds of the Denver, Leadville & Gunnison, issued Aug. 1, 1889. Collateral consisting of 2,254 first mortgage bonds of the Denver, Leadville & Gunnison Company, deposited with the New England Trust Co., but which were thereafter taken by the Central Trust Co., were sold by the latter trust company, owing to default in interest, at public auction, Sept. 19, 1894, and realized $25,000. It is declared in the complaint that the bonds sued on became payable by virtue of the sale of the collateral, and interest is asked from Oct. 10, 1894.

Florence & Cripple Creek.—President Johnson admits that an option has been granted for the sale of this property, the price being fixed at $2,000,000. He thinks the sale will go through. The road now in operation is about 40 miles in length from Florence, on the Denver & Rio Grande, north to the Cripple Creek mines.

Frankfort & Southeastern.—Albert C. Hall, of New York, as Trustee of the bondholders of this railroad in Michigan, has received a decree for $263,576 from the United States Court in Grand Rapids, Mich., in the foreclosure involving that road. The road is operated as a part of the Toledo, Ann Arbor & North Michigan.

Illinois Central.—The company reports income from traffic for the seven months ending Jan. 31, 1895, and 1894, as follows:

	1895.	1894.	Inc. or dec.
Miles operated	2,888	2,888	.....
Gross receipts from traffic.	$11,437,162	$13,626,175	D. $2,189,013
Oper., expen. & taxes	8,031,555	9,020,233	D. 988,678
Net earnings	$3,405,607	$4,605,942	D. $1,200,335

The gross receipts from traffic for the month of February, 1895, are estimated at $1,411,804; the receipts for February, 1894, were $1,428,810, showing an estimated decrease of $17,006.

London & Port Stanley.—The city of London, Ont., through the trustees of this railroad, has instructed its solicitors to take steps to recover $51,000 from the Grand Trunk. Over 20 years ago the latter leased the London & Port Stanley, which was owned by the city of London, Ont., on the understanding that the lessee would make good any depreciation in the value of the road during the lease. This the city estimates at $51,000, but the Grand Trunk disputes the claim. The lease expired in 1890, and was not renewed. Since then the city has leased the road several times, but in each case the conditions of rental were not met. Some months ago the Michigan Central undertook to operate the road.

Lake Street Elevated.—D. H. Louderback, President of the Lake Street Elevated Road, announces that the plan of the Slaughter Committee for a reorganization of that company had been accepted by a full majority of the bondholders. Holders of something over $4,000,000 of the bonds have agreed to a scaling down of their securities to 60 per cent., and to take 15 per cent. of the par value of their present holdings in income bonds. The first mortgage bonds will be guaranteed by the Northwestern Elevated Company.

Louisville, Evansville & St. Louis.—Judges Baker and Allen, of the Federal Court at Indianapolis, have authorized E. O. Hopkins and James H. Wilson, Receivers of the railroad, to issue $200,000 in receivers' certificates for the payment of salaries and other expenses.

Metropolitan Elevated (Chicago).—On March 25, about 1,200 shares of Metropolitan Elevated construction stock on which the last assessment of 40 per cent. has not been paid will be sold out in New York by the construction company. Stock which has been fully paid up is now quoted at about 80. The proposition to issue preferred stock in place of the remaining $5,000,000 bonds that have been authorized is still under consideration. It is claimed that the opening of the road is only delayed by the failure to have electrical equipment ready when expected. This equipment is being furnished by the General Equipment Company.

Monterey & Mexican Gulf.—Litigation involving the claim of the Belgian bondholders of the company has terminated, the Belgians desisting from pressing their claims against the property, which will soon be offered for sale. The Supreme Court of Mexico affirms the right of the Mexican courts to jurisdiction over the railroad, and General Manager Robertson remains in control as Receiver.

New York Central & Hudson River.—The directors last week reduced the quarterly dividend ¼ per cent. to 1 per cent. The approximate statement for the quarter ended March 31 shows earnings of but 0.37 per cent., against 0.98 per cent. last year. The nine months' statement shows 2.85 per cent. earned, against 3.59 per cent. the previous nine months. The operating expenses for the March quarter were 69.42 per cent. against 64.55 per cent. in 1894, and for nine months they were 66.63 per cent., against 66.92 per cent. The company sold no stock or bonds in the quarter. The comparative exhibit for the quarter and nine months follows:

Quarter Mar. 31,	1895.	1894.	Inc. or Dec.
Gross earnings	$9,667,400	$9,722,854	D. $55,454
Oper. expenses	6,712,700	6,276,392	D. 436,308
Net earnings	$2,954,700	$3,446,462	D. $491,762
Fixed charges	2,600,000	2,527,462	I. 72,538
Profit	$354,700	$918,999	D. $564,299
Dividends	954,300	1,174,701	D. 220,401
Deficit	$599,600	$255,702	D. $343,898
Since July 1.			
Earnings	$31,826,400	$33,762,613	D. $1,936,213
Net earnings	10,620,000	11,168,801	D. 548 801
Fixed charges	7,857,600	7,741,120	I. 116,520
Profit	$2,762,400	3,427,720	D. $665,320
Dividend	3,340,000	3,410,408	D. 70,408
Deficit	$577.600	Surp. $17,312	I. $594,912

Oregon Railway & Navigation Co.—Judge Bellinger, at Portland, Or., denied the petition of the Oregon Railway & Navigation Company to require Receiver McNeill to keep a separate accounting for the different lines in the Oregon Railway & Navigation system. This petition was in the interest of the Union Pacific.

Philadelphia & Reading.—The management, it is understood, have decided to oppose the general mortgage foreclosure proceedings which have been instituted and prevent, if possible, the sale of the property.

Sanford & St. Petersburg.—The Plant system has purchased the Sanford & St. Petersburg Railroad, known as the Orange Belt, which operates between Sanford, Fla., on the St. Johns River, and St. Petersburg, on Tampa Bay. Possession will be taken April 1 next. The Florida Southern was purchased last summer and the gage of both roads is to be altered from narrow to standard width and new equipment supplied. At Macon, the junction of the Savannah, Florida & Western and Orange Belt roads, the traffic for Key West, Cuba and other points reached by steamer, will be diverted and sent over the newly acquired line to St. Petersburg, saving 100 miles' haul. The newly acquired road is 152 miles in length.

Sioux City & Northern.—The Union Loan & Trust Co. has appealed from the decision of Judge Shiras, of the United States Court, awarding to J. Kennedy Tod & Co., bankers of New York, $3,400,000 worth of Sioux City & Northern and Sioux City, O'Neill & Western securities deposited with Tod & Co. as security for a loan of $1,500,000, but previously pledged, as alleged, to the Union Loan & Trust Co. to secure $3,000,000 of indorsements. Pending the appeal, the effect of which will be to delay foreclosure proceedings, an effort will be made to reorganize the properties by the Credits Commutation Co., of Sioux City, which has acquired the assets of the Union Loan & Trust Co. and represents all the local creditors of these properties.

Southern.—The company makes this statement of earnings for January and seven months:

January.	1895.	1894.	Increase or decrease.
Gross earnings	$1,496,296	$1,512,156	D. $15,860
Operating expenses	1,043,740	1,065,550	D. 21,810
Net earnings	$452,556	$446,606	I. 5,950
Since July 1.	1894-'95.	1893-'94.	
Gross earnings	$10,242,436	$9,727,370	I. $515,066
Operating earnings	6,690,016	6,717,415	D. 27,399
Net earnings	$3,552,420	$3,009,955	I. $542,465

St. Louis & Peoria.—George Coppell, of New York, and Alonzo C. Monson, as executors, have filed a bill in the United States Circuit Court, at Springfield, Ill., asking that the St. Louis & Peoria Railroad, between Springfield and Litchfield, be sold to satisfy a judgment of $78,783 obtained in that court June 5, 1893, against the railroad, and that in the meantime a writ of possession be issued to them for all the property owned by the railroad.

Union Pacific.—The statement of the company for January makes a record of decreases from last year. All the lines show a corresponding falling off in gross and net earnings, while the Oregon Short Line adds to its gross decrease an increase in operating expenses of $25,351. The detailed operations follow:

UNION PACIFIC.

Month of January:

	1895.	1894.	Inc. or Dec.
Gross earnings	$970,520	$1,039,115	D. $68,595
Operating expenses	674,985	735,186	D. 60,201
Net earnings	$295,535	$303,929	D. $8,394
Mileage	1,822	1,822	

OREGON SHORT LINE & UTAH NORTHERN.

January:

Gross earnings	$330,462	$344,012	D. $13,549
Operating expenses	266,676	241,325	I. 25,351
Net earnings	$63,786	$102,687	D. $38,900
Mileage	1,427	1,427	

GRAND TOTAL OF UNION PACIFIC SYSTEM.

January:

Gross earnings	$1,516,936	$1,742,421	D. $195,484
Operating expenses	1,126,662	1,227,963	D. 101,300
Net earnings	$390,274	$484,457	D. $94,183
Mileage	5,327	5,327	

It is given out at Omaha that the United States Government is not likely to appear in the foreclosure suit brought by the trustees for the first mortgage bondholders. In deciding on this action, attorneys for the Government hold that the foreclosure will not affect the status of the Government's liens. Unless the Government appears voluntarily it cannot be made party defendant to the suit, and no order of the Court can operate prejudicially to its interest.

Union Terminal.—The contest between the Missouri Pacific and the Kansas City Suburban Belt road, of which this company is the Kansas division, has been decided in a decree entered at Kansas City, in the United States Circuit Court. Judge Sanborn orders that the Union Terminal Company, of Kansas City, may cross the Union Pacific and Missouri Pacific tracks, and allows the Union Terminal Company until Sept. 9 in which to build an overhead crossing. The cost is to be borne equally by the three companies. This case has been in the United States court for three years.

Western New York & Pennsylvania.—The stockholders of the Northwestern Pennsylvania and the Western New York Railway Companies have consolidated under the above name. This formality was necessary in order to complete the reorganization of the Western New York & Pennsylvania Railroad, recently sold under foreclosure proceedings. The old officers and directors of the latter company have been elected to serve in the same capacities with the new company. The reorganization of the road has been practically completed, and it will be taken out of the receiver's hands about April 1. New general mortgage and income preference bonds, for which most of the money has been subscribed, will be issued. The floating indebtedness and some other general liabilities still remain, but the money to take care of these will be forthcoming.

TRAFFIC.

Traffic Notes.

The Westinghouse Air Brake Co. has declared a quarterly dividend of five per cent., payable to stock of April 10.

The railroads which have decided to withdraw the reduced passenger rates to clergymen are the New York Central, the Erie, the West Shore and the Delaware, Lackawanna & Western. The Pennsylvania, the Philadelphia & Reading, the Lehigh Valley and the Baltimore & Ohio, will continue the privilege, at least to the end of 1895.

The refusal of the Philadelphia & Reading to longer join in the through rates on coal to Philadelphia from points on the Lehigh Valley and the Central of New Jersey has resulted in the announcement of new tariffs, increasing the freight rate considerably on this coal. The advances vary from 11 cents to 41 cents a ton.

The Atlantic Coast Line is running excursions to the Island of Jamaica.

Chicago Traffic Matters.

CHICAGO, March 20, 1895.

At the meeting of Southwestern lines held last week it was found impossible to agree upon a basis for a revision of percentages on freight traffic and the whole question was again referred to Chairman Bird, of the Western Trunk Line Committee. The Burlington and the Missouri Pacific claim that they are entitled to larger percentages than were awarded them last October. The other lines were willing, for the sake of peace, to concede something, but before any agreement had been reached such a serious disagreement arose over proportions of through rates allowed some of the short lines that a rupture was only prevented by referring the matter to Chairman Bird, with an added resolution that pending his report all rates shall be maintained, and adjourning.

The General Freight Committee of the Central Traffic Association has increased the 4th class differential from Milwaukee across Lake Michigan from 2 to 3 cents per 100 lbs.; extended the time limit on wheat milled in transit during July, August and September, this year, from 30 to 90 days; and recommended that the minimum weight of horses in car loads in cars of over 36 feet (inside measurement), be increased 3 per cent. for each additional foot.

The standard and differential eastbound lines are at loggerheads over the demands of the latter that the differential principle, as decided in their favor by Commissioner Blanchard, on round trip business shall be applied to the excursion rates to the important gatherings at the East this summer. The standard lines flatly refuse to concede the differential in their rate sheets and the differential lines now threaten to get out their own rate sheets, and let the standard lines issue individual sheets.

The efforts of the Chicago & Northwestern to compel suburban "purchasing agents" to ship their purchases by express has led to a complaint by residents of Aurora to the Illinois State Railroad Commissioners charging the road with unjust discrimination. The Commission referred the question to the Attorney-General, who decides that the law as sustained by the Supreme Court requires common carriers to transport free 100 lbs. of ordinary baggage with each passenger; that "ordinary baggage" does not mean merchandise; therefore, the common carrier is not required to carry merchandise free. He holds further that no unjust discrimination is caused when by an act of grace the common carrier allows other passengers to perform an act to which they are not entitled by right.

The shipments of eastbound freight, not including live stock, from Chicago by all the lines for the week ending March 16, amounted to 64,589 tons, against 55,424 tons during the preceding week, an increase of 9,165 tons, and against 89,616 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	WEEK TO MARCH 16. Tons.	p. c.	WEEK TO MARCH 9. Tons.	p. c.
Michigan Central	4,104	6.4	3,678	6.7
Wabash	7,128	11.1	4,426	7.9
Lake Shore & Mich. South.	7,151	11.1	8,182	14.8
Pitts., Ft. Wayne & Chicago	5,869	9.0	8,243	14.9
Pitts. Cin., Chi. & St. Louis.	5,676	8.8	4,581	8 3
Baltimore & Ohio	1,845	2.8	2,637	4.8
Chicago & Grand Trunk	7,677	11.8	4,285	7.7
New York, Chic. & St. Louis	11,566	18.0	11,755	1.2
Chicago & Erie	12,053	18.6	5,972	10.7
C., C., C. & St. Louis	1,550	2.4	1,662	3.0
Totals	64,589	100.0	55,424	100.0

Of the above shipments 5,652 tons were flour, 28,735 tons grain and mill stuff, 13,602 tons cured meats, 7,206 tons dressed beef, 1,413 tons butter, 1,001 tons hides and 5,573 tons lumber. The three Vanderbilt lines carried 35.5 per cent., the two Pennsylvania lines 17.8 per cent.

Heavy Freight Movement on the New York, New Haven & Hartford.

A press despatch from New Haven, Conn., containing information evidently given out by some officer of the road, shows a very large increase of freight on this company's New York Division, as indicated by the figures given below. It is stated that this increase is largely on account of through tariffs which have been arranged within the past year between the coal roads of Pennsylvania and New Jersey and the New Haven Company, for east bound traffic. The New Haven road has also arranged through rates from the west, by the trunk lines terminating at New York, which tend to throw the traffic in grain and other western products over this route for local points on both the New Haven and the Old Colony systems, instead of over the Boston & Albany and Fitchburg roads. These roads are understood to be carrying into New England much less through freight than formerly for local stations on the lines of the New Haven Company:

CARS MOVED, N. Y., N. H. & H. R.R., NEW YORK DIVISION.

	1895.	1894.	Inc.	P. c.
January	42,043	27,562	14,481	52
February, loaded 27,301 / " empty 10,625	37 926	22,299	15,627	70
	79,969	49,861	30,108	60

A Bit of Ancient History.

Judge Adams, sitting in the Circuit Court at Chicago, has handed down a decision defining the responsibility of a road in issuing tickets reading over its own and connecting lines. The decision was in the case of Mulford & McKenzie, ticket brokers, against the Chicago & Alton, to compel the road to pay the value of a certain block of tickets sold by it to the complainants in December, 1880. The brokers secure a judgment for $10,854 against the Alton. They bought $50,000 worth of tickets from the road at 50 cents on the dollar, the tickets being good between Kansas City and Bloomington on that road, and thence east over the Lake Erie & Western. A passenger rate war followed and these tickets were unsalable for two years. The Lake Erie & Western went into the hands of a receiver, and the tickets were dishonored by its conductors, in accordance with an order of the court The decision says:

"I find as to each of the tickets in question that the evidence is strong enough to imply a special undertaking by the defendant to carry the holder of the ticket to the station stamped on the margin. A railroad company may lawfully contract to convey passengers beyond its own line, provided its own line is a part of the journey. A railroad ticket is not a mere voucher, showing that the railroad fare had been paid, but it is certainly something more. While the entire contract between a company selling a ticket and the purchaser thereof may not be expressed on the ticket, yet the ticket is evidence of a contract and is conclusive as to all expressed on it."